

JUL 14 1924

Series 3, Vol. 7, No. 7

JULY, 1924

AMERICAN JOURNAL OF OPHTHALMOLOGY

Incorporating

Established by

THE AMERICAN JOURNAL OF OPHTHALMOLOGY.....Adolph Alt 1884
THE OPHTHALMIC RECORD.....Giles C. Savage 1891
ANNALS OF OPHTHALMOLOGY.....James Pleasant Parker 1892
ANALES DE OFTALMOLOGIA.....M. Uribe-Troncoso 1898
OPHTHALMOLOGY.....Harry Vanderbilt Würdemann 1904
OPHTHALMIC YEAR BOOK AND LITERATURE.....Edward Jackson 1904-11

EDITORIAL STAFF

EDWARD JACKSON
Editor
U. URIBE-TRONCOSO
MEYER WIENER

CLARENCE LOEB
Associate Editor
CASEY A. WOOD
HARRY V. WÜRDEMANN

COLLABORATORS

FRANK ALLPORT, *Chicago*; HUGO W. AUFMWASSER, *Cincinnati*; HANS BARKAN, *San Francisco*; ARTHUR J. BELL, *Albany*; EDMOND E. BLAAUW, *Buffalo*; MELVILLE BLACK, *Denver*; FRANK E. BRAWLEY, *Chicago*; BURTON CHANCE, *Philadelphia*; WILLIAM H. CRISP, *Denver*; EDWARD C. ELLETT, *Memphis*; MARCUS FEINGOLD, *New Orleans*; WILLIAM C. FINHOFF, *Denver*; WALTER S. FRANKLIN, *San Francisco*; M. W. FREDRICK, *San Francisco*; HAROLD GIFFORD, *Omaha*; SANFORD R. GIFFORD, *Omaha*; HARRY S. GRADLE, *Chicago*; D. F. HARRIDGE, *Phoenix, Arizona*; WILLIAM F. HARDY, *St. Louis*; EMORY HILL, *Richmond, Va.*; THOMAS B. HOLLOWAY, *Philadelphia*; JOHN A. McCaw, *Denver*; LLOYD MILLS, *Los Angeles*; WILLIAM R. MURRAY, *Minneapolis*; WALTER R. PARKER, *Detroit*; LAWRENCE T. POST, *St. Louis*; F. MAYO SCHNEIDEMAN, *Philadelphia*; THEODORE B. SCHNEIDEMAN, *Philadelphia*; GEORGE E. DE SCHWEINITZ, *Philadelphia*; THOMAS H. SEASTID, *Superior, Wis.*; CHARLES P. SMALL, *Chicago*; D. L. TILDERQUIST, *Duluth*; HENRY P. WAGNER, *Rochester, Minn.*; WILLIAM ZENTMAYER, *Philadelphia*; CHARLES ZIMMERMANN, *Milwaukee*. Foreign: RAUL ARGANARAZ, *Buenos Aires, Argentina*; SIR JAMES W. BARRETT, *Melbourne, Australia*; MARCEL DANIS, *Brussels, Belgium*; ROBERT HENRY ELLIOTT, *London, England*; JULIUS FEJÉR, *Buda-pest, Hungary*; F. M. FERNANDEZ, *Havana, Cuba*; J. DE J. GONZALEZ, *Leon, Mexico*; HARVEY J. HOWARD, *Peking, China*; M. LANDOLT, *Paris, France*; ARTHUR F. MCCALLAN, *Cairo, Egypt*; SPECIALE CIRINCIONE, *Rome, Italy*; FREDERICK C. TOOKE, *Montreal, Canada*; MAJOR R. E. WRIGHT, *Madras, India*.

Single number, one dollar

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY
7 West Madison Street, Chicago, Illinois.

Entered as Second Class Matter January 1st, 1918, at the Post Office, Chicago, Ill., under the act of March 3rd, 1879.

**WHY
PUNKTALS
ARE BETTER**

1. **PUNKTALS** give a wider visual angle than any other lens.
2. **PUNKTALS** are "custommade"—individually computed for each power.
3. **PUNKTALS** are surfaced on both sides by Bausch & Lomb.
4. **PUNKTALS** are promptly supplied by Riggs Optical Company.
5. **PUNKTALS** are light in weight.
6. **PUNKTALS** are handsome in appearance.
7. **PUNKTALS** are as easily prescribed as ordinary torics.
8. **PUNKTALS** will increase the satisfaction of your patients.
9. **PUNKTALS** will enhance your professional reputation.

PUNKTALS
are made in America Only
by the Bausch & Lomb
Optical Company.

PUNKTALS—

The Wide Angle Lenses for the eyes

OF all the different front and back surface curves that will make any given lens power, there is but one combination that will produce a lens free from astigmatism throughout the field.

A plus two, for instance, can be made with a plus one curve on each side; with a plus three and a minus one, a minus six and a plus eight, or any of the in-between combinations.

A plus two Punktal, however, is made with that particular combination which eliminates marginal astigmatism. Punktals are therefore known as the modern wide angle lenses for the eyes.

This is but one of the many reasons why Punktals are the finest ophthalmic lenses made; the truly anastigmatic, wide angle lenses for the eyes.

**PLEASE WRITE FOR INTEREST-
ING PUNKTAL LITERATURE**

*We carry comprehensive stocks of Punktal
Lenses and so can give prompt service.*

Riggs Optical Company

Exclusively Wholesale

Omaha
Sioux City
Cedar Rapids
Quincy
Waterloo
Madison
Mankota
Fort Dodge
Santo Anna

Kansas City
Oklahoma City
Wichita
Lincoln
Hastings
Sioux Falls
Pittsburg, Kan.
Green Bay
Council Bluffs

Portland
San Francisco
Salt Lake City
Ogden
Denver
Pueblo
Pargo
Appleton
Great Falls

Seattle
Los Angeles
Spokane
Tacoma
Helena
Boise
Pocatello
Salina
St. Paul

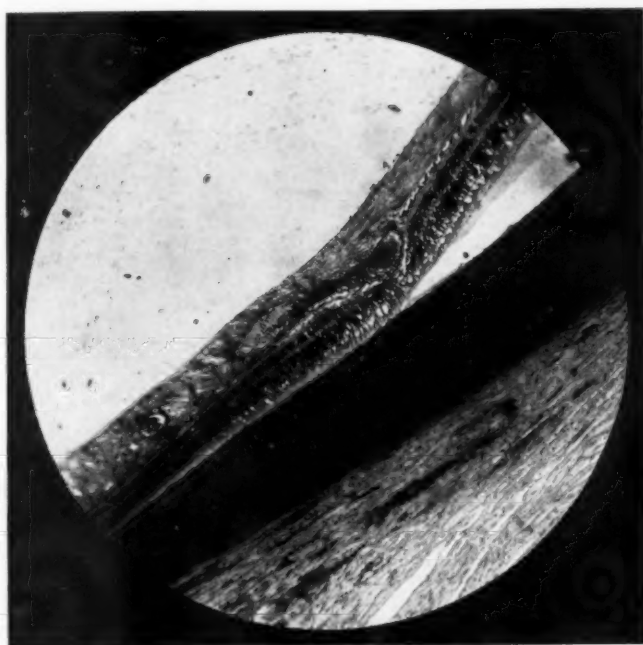


FIG. 1. SECTION OF AN EYE WHICH CAUSED SYMPATHETIC OPHTHALMIA. NOTE LESION IN CHOROID, WHICH IS MUCH THICKER THAN NORMAL. THE VESSELS ARE DILATED AND THERE IS INTENSE LYMPHOCYTIC INFILTRATION.

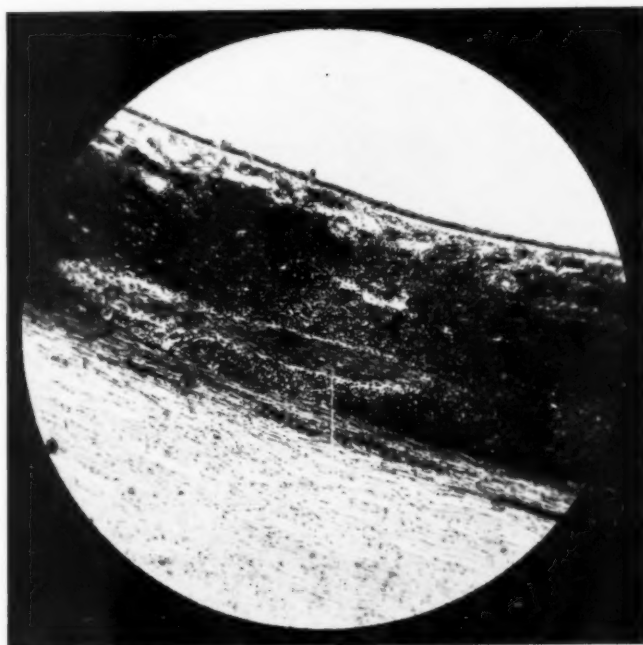


FIG. 2. SYMPATHETIC OPHTHALMIA. SIMILAR TO FIGURE 1, BUT MORE MARKED IN DEGREE. NOTE ALSO THE PERIVASCULAR INFILTRATION IN THE SCLERA.

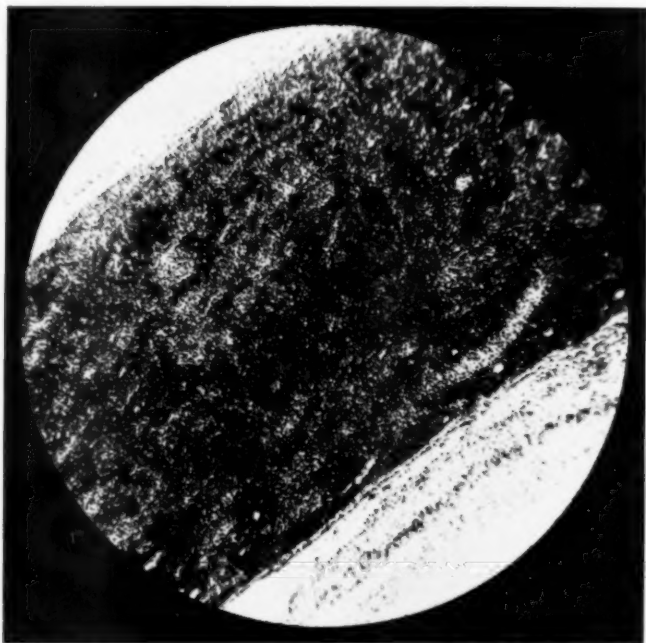


FIG. 3. SYMPATHETIC OPHTHALMIA. THE DEGREE OF INVOLVEMENT IS STILL GREATER, NOT ONLY IN THE CHOROID, BUT ALSO IN THE RETINA. THE CHOROID IS A MASS OF LYMPHOCYTES, AND THERE IS ACTUAL DESTRUCTION OF THE RETINA.



FIG. 4. TRAUMATIC RETINO-CHOROIDITIS PROLIFERANS. A DRAWING FROM A CASE IN THE CANADIAN ARMY, OBTAINED OVERSEAS.

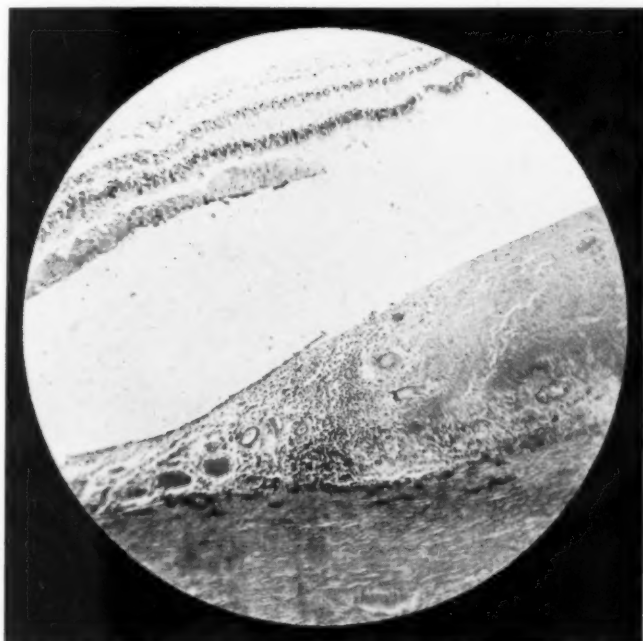


FIG. 5. MILIARY TUBERCULOSIS OF THE CHOROID. NOTE THE GIANT CELLS AND CASEATION.

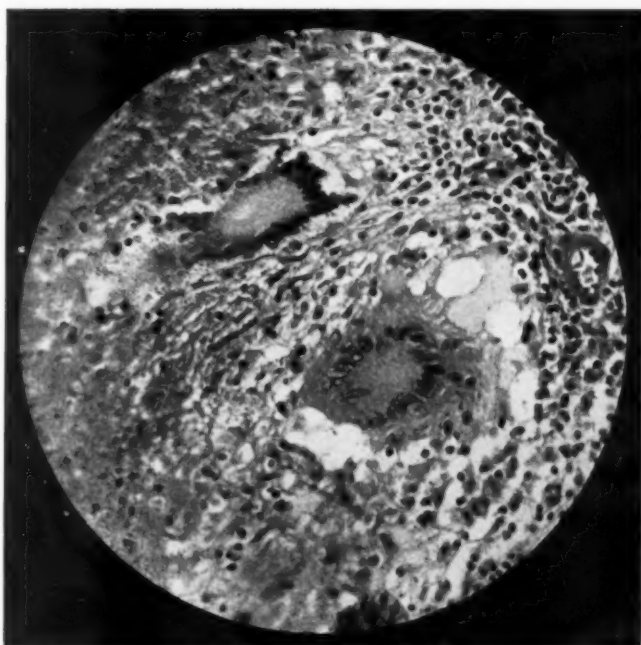


FIG. 6. MILIARY TUBERCULOSIS OF THE CHOROID. A HIGH POWER OF NUMBER 5 SHOWING TWO GIANT CELLS.



FIG. 7. BONE IN THE CHOROID.

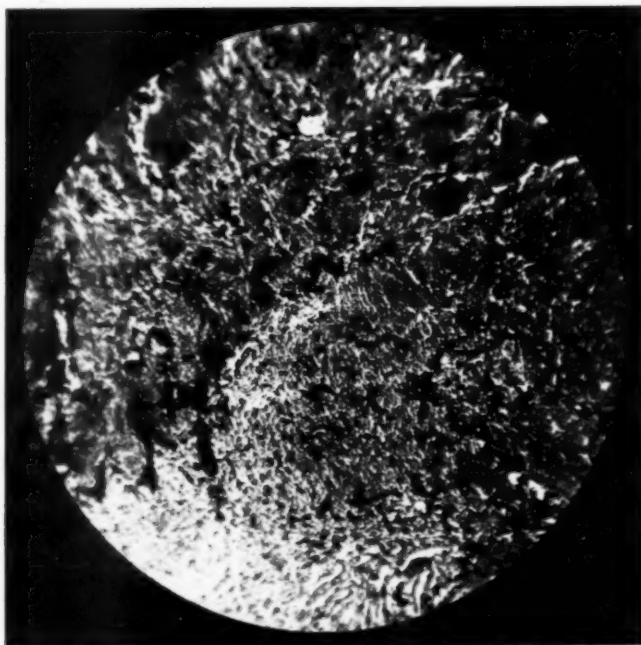


FIG. 8. SARCOMA OF THE CHOROID. SHOWING PIGMENTATION.

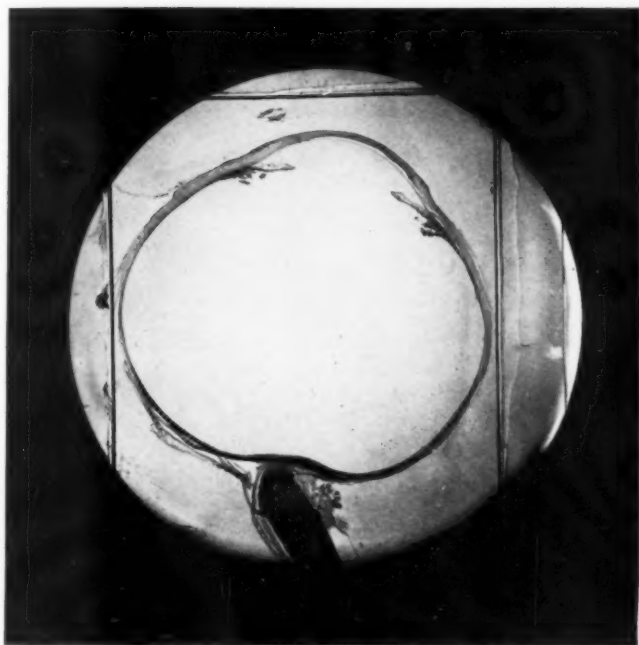


FIG. 9. SARCOMA OF CHOROID. NOTE TINY TUMOUR TO RIGHT OF OPTIC NERVE.

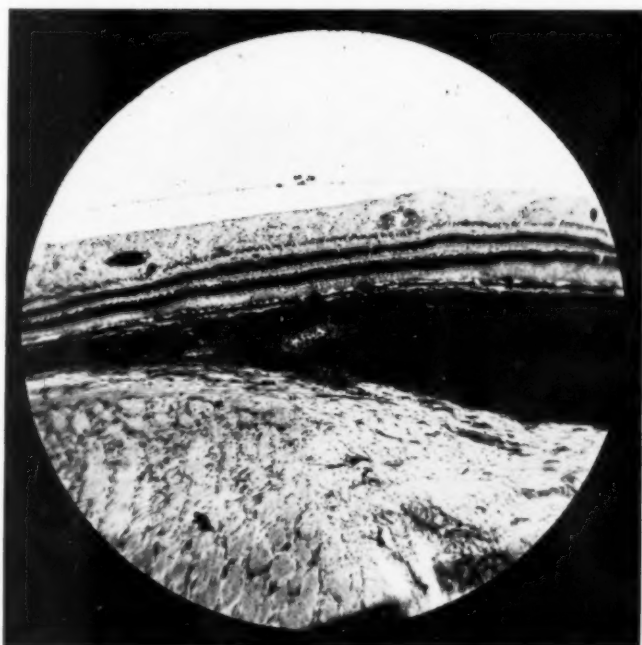


FIG. 10. SARCOMA OF THE CHOROID. SAME AS NUMBER 9, HIGHER POWER.

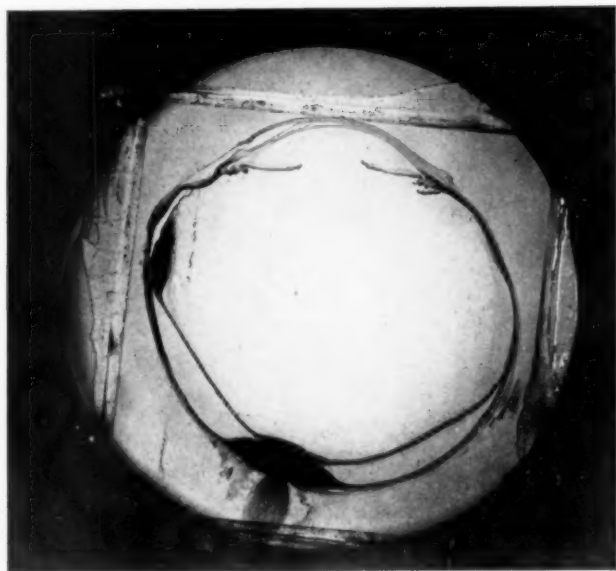


FIG. 11. SARCOMA OF CHOROID.

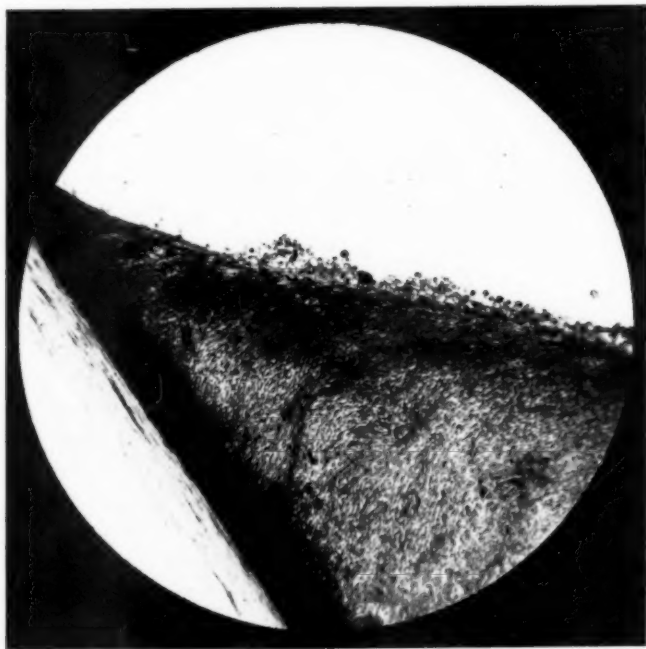


FIG. 12. SARCOMA OF THE CHOROID. HIGH POWER.

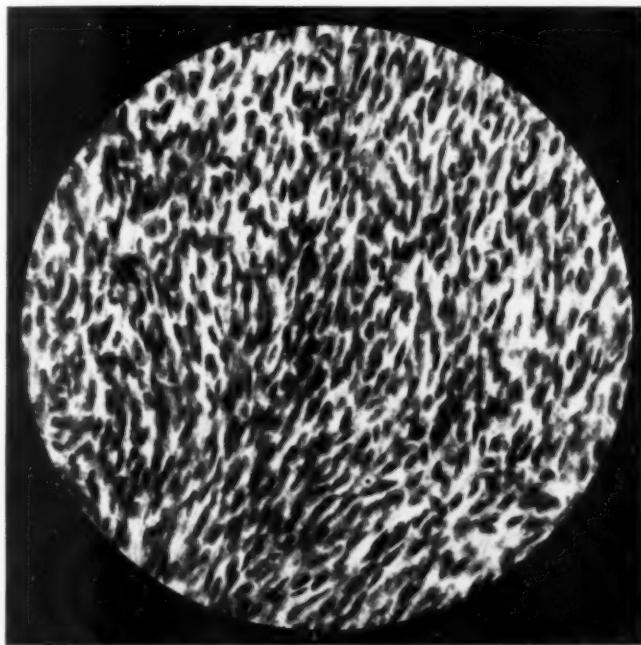


FIG. 13. SARCOMA OF THE CHOROID. HIGH POWER, SHOWING SPINDLE CELLS.

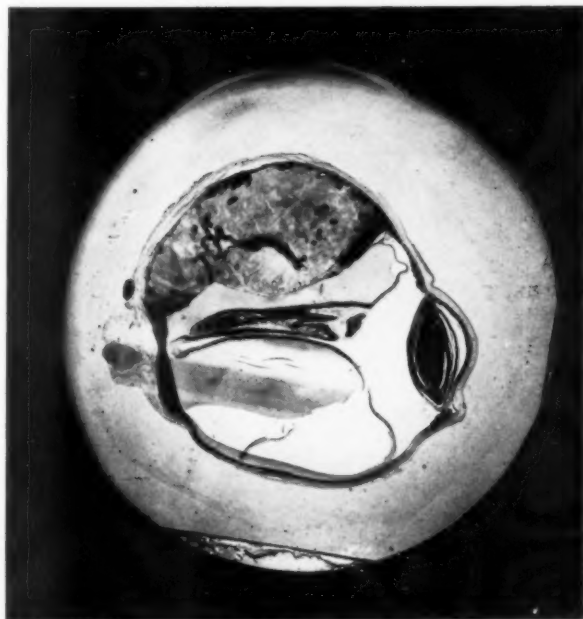


FIG. 14. CARCINOMA OF THE CHOROID. A SPECIMEN FROM J. A. MACMILLAN.

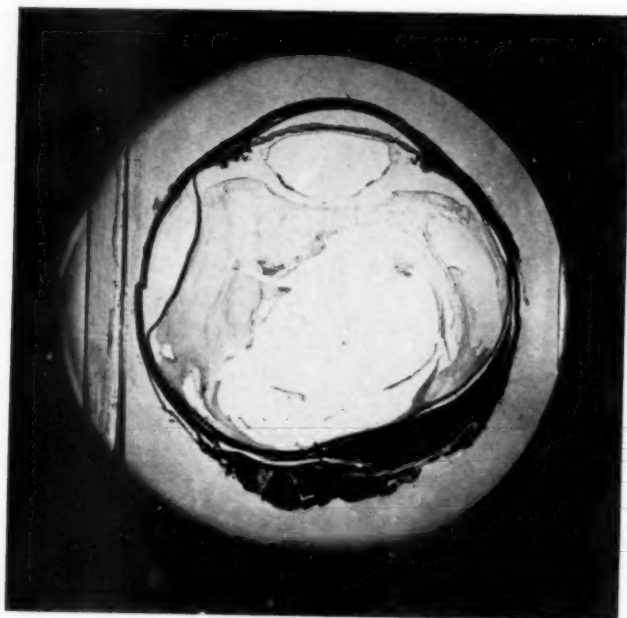


FIG. 15. CARCINOMA OF THE CHOROID.

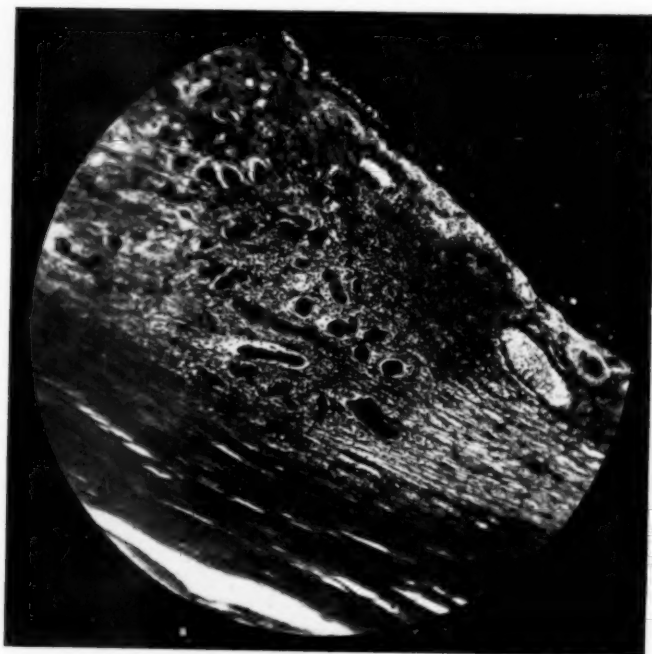


FIG. 16. CARCINOMA OF THE CHOROID, SAME AS FIGURE 15. HIGHER POWER.

NOTES ON PATHOLOGY OF THE CHOROID.

S. HANFORD MCKEE, M.D.

MONTREAL, CANADA.

After a review of the histology of the choroid, this paper takes up the changes found in choroiditis. Suppurative choroiditis is first considered. Exudative choroiditis includes sympathetic ophthalmitis, disease due to syphilis, trauma and tuberculosis. Sarcoma of the choroid is considered at length. Carcinoma is secondary, but the changes it causes are interesting. The work on which this paper is based was done in the pathologic laboratory of the Montreal General Hospital, in preparation for a lecture given in the Instructional Course of the American Academy of Ophthalmology and Oto-Laryngology, Minneapolis, 1922.

The choroid is that part of the uveal or middle tract of the eye, which lines the posterior section of the globe from the optic nerve to the ora serrata. It covers about two-thirds of the interior, and is brown in color. It is loosely attached to the sclera, a condition which allows of easy adjustment to variations in position and size, caused by the action of the ciliary muscle, or changes in volume of its many blood vessels. It is firmly attached at the optic papilla.

When the fundus is examined, the color of the background is determined chiefly by the amount of pigment in the stroma, and the volume of blood in the vessels. The choroid consists mainly of vessels arranged according to their caliber, in three superimposed layers. As it is designed for the nourishment of the retina, we have the capillaries from which the nutrient plasma of the blood exudes, to the inner side of the choroid. The vascular structure is bounded on each side by a nonvascular membrane, so that we have from without in, the following five layers:

1. The suprachoroid layer.
2. The layer of large vessels (Hall-er's layer).
3. The layer of medium sized vessels (Sattler's layer).
4. The choriocapillaris, or Membrana Ruyschii.
5. The lamina vitrea.

HISTOLOGY. The suprachoroid is formed chiefly of elastic fibers and pigment corpuscles loosely arranged. It is connected with the sclera by loose con-

nective tissue. The layer of large vessels, the lamina vasculosa, forms the mass of the choroid, and consists of vessels and nerves in a stroma of elastic fibers, and pigment cells, which support the large venous whorls, known as the venae vorticosae. The veins converge to four or five principal trunks, which empty into the ophthalmic vein.

The choriocapillaris forms the richest vascular plexus of the whole body. The capillaries of this layer are so broad that several blood corpuscles may pass thru them side by side. They do not form a meshwork, but a net, that is, they occupy one plane. The net is especially thick in the region of the fovea. This layer consists almost exclusively of capillaries with a wide bore, and at the same time are so closely packed together, that the interspaces between the capillaries are often narrower than the capillaries themselves.

The capillary network of the choriocapillaris is fed by the arteries directly. The blood from this flows off thru a great number of veins that keep uniting to form larger and larger trunks, which simultaneously converge to a common center, which cause generally a sort of "Whorl or Vortex." The vortices, the number of which amount to at least four or more, lie somewhat behind the equator of the eye. From them are given off the venae vorticosae, which perforating the sclera in a very oblique direction, carry off the blood to the outside. This layer, as also the lamina vitrea, contains no pigment. The lamina

vitrea separates the choroid from the retina. It consists of an inner and an outer layer, is firmly grown to the stroma of the capillary layer, and is highly refractile.

The arteries of the choroid consist of:

1. The recurrent branches of the long posterior ciliary.
2. The anterior ciliary.
3. Numerous branches of the short posterior ciliary.

The ciliary nerves form in the choroid a dense plexus, in which numerous ganglion cells are intercalated. It seems to possess no sensory nerves.

Clinically, choroiditis is divided into—diffuse, disseminated, circumscribed, with numerous other subdivisions. Pathologically, it is divided into: 1. Suppurative. 2. Exudative.

SUPPURATIVE CHOROIDITIS is usually a part of a general panophthalmitis, due to a perforating wound with a septic body. One finds infiltration with polymorphonuclear leucocytes, first in the inner layer, and around the medium sized and smaller vessels. The large vessels long remain free from infiltration, as does the nonvascular suprachoroid. The hyperemia, edema, and infiltration lead to great thickening of the choroid, which may be seven or eight times its normal thickness. The vessels are much altered, the lumen of the arteries is often filled with a thrombus, composed of fibrin, leucocytes, and red blood corpuscles. The membrane of Bruch offers all possible resistance to the fluid exudate which altho present in considerable quantities in the stroma, is mostly pressed out into the suprachoroid space. Some of the fluid at times filters thru the membrane of Bruch, raising the retina slightly over a large area, and causing occasionally a considerable detachment, more or less localized.

An eye with *panophthalmitis* would show the eye very distorted in outline, because the eye had likely collapsed following a perforating wound. The anatomic structures would be indistinct, that is the chambers would be filled with blood and pus. The choroid and retina would show marked degeneration and would be detached in places, because of

the collections of pus and blood between the choroid and retina. The choroid would be much thickened, because of the infiltration with polymorphonuclear leucocytes.

EXUDATIVE CHOROIDITIS. The changes found in this condition, which is subacute or chronic in its course, are:

1. Vascular congestion.
2. Infiltration with lymphocytes.
3. Edema.
4. Migration of pigment into the retina.

The most striking feature is the infiltration with lymphocytes. This may be localized, especially around some of the distended vessels of Sattler's layer, or it may be diffuse. The blood vessels are dilated, and often contain an abnormal number of leucocytes, chiefly arranged at the periphery. The stroma cells are seen with difficulty, being obscured by the lymphocytes. The pigment epithelium of the retina undergoes degenerative changes, especially in those cases in which the inner layers of the choroid are most affected, and above all, when the membrane of Bruch has been broken thru. Exudation located between choroid and retina may go on to a connective tissue membrane, binding the choroid fast to the retina, and in this situation the two membranes become atrophic. From the choroid, the fine vessels and chromatophores in great part disappear, and the vessels that are left either have their walls thickened and sclerosed, or obliterated altogether.

A specimen of *phthisis bulbi* then would show—

1. Intense engorgement of the blood vessels.
2. The pigmentary layer of the retina would be distorted, the cells would be there, but they would have lost their anatomic relations.
3. Cellular infiltration of mild degree.
4. The retina would show intense edema and dilatation of the vessels.

Sympathetic ophthalmia is a serous or plastic inflammation of the uveal tract in one eye, due to the effect of a similar inflammation in the other. See plate XII Fig. 1. In this eye which caused a sympathetic ophthalmia, we have a pathologic lesion, which is very definite

The position of the lesion is in the choroid, which is about twice as thick as normal. Its structure is obscured because something has been added, that is lymphocytes, not in patches, or in lines, or in zones, but in a diffuse infiltration. The vessels are dilated, there is intense lymphocytic infiltration. The sclera also has some inflammatory reaction marked about the blood vessels. It is a proliferative, rather than a degenerative change. The retina is edematous, so that we have:

1. Engorgement of the vessels.
2. Marked edema.
3. Intense lymphocytic infiltration.

In plate XII, Fig. 2, also a case of sympathetic ophthalmia, the picture is very like Figure 1, except the degree of inflammation is more marked. Note also the perivascular inflammation in the sclera.

In Fig. 3, Plate XIII, the degree of involvement is much greater still, not only in the choroid, but also in the retina, that is the band is much wider. There is more involvement of the sclera, there is actual destruction of the retina. The choroid is a mass of lymphocytes.

Syphilis is one of the commonest causes of choroiditis and generally manifests itself in the disseminated form. It occurs in both hereditary and acquired syphilis. The changes are similar to those of acute and chronic choroiditis. Degenerative changes in the vessels may be absent or slight, but as in most syphilitic conditions they are generally a prominent feature.

Traumatic retinochoroiditis proliferans does not follow the hemorrhages of the vitreous, as recurring hemorrhages in young subjects, but follows hemorrhages of the choroid and retina produced by rupture.

Fig. 4, plate XIII, is a typical picture of a traumatic retinochoroiditis proliferans, the result of extravasations situated outside the vitreous.

In the eyes of elderly persons, and in chronic choroiditis, especially in phthisis bulbi, globular thickenings are seen upon the inner surface of the membrane of Bruch, covered by irregular, more or less degenerated, pigment epithelial cells. These are called colloid

bodies or "drusen." They have long attracted attention and opinions of them are divided into two groups.

One believes that the excrescences arise from actual transformation of the cells of the pigment epithelium, while the other group believes that they arise as a membrane itself is supposed to arise, as a deposit from the cells of the pigment epithelium but without actual transformation of pigment cells into the excrescence. These are the "transformation" and "deposition" theories respectively.

Cases which have been seen and later examined pathologically are rare. Liebreich described the first in 1858, later Hutchinson and Tay described the condition since called "Tay's choroiditis." They correctly conjectured that this was due to these excrescences. Coats has been able to observe them clinically in one eye, and to find them microscopically in the other, of the same patient.

Tuberculosis of the choroid appears as:

1. A miliary tubercle, or
2. Chronic tubercle in one of two forms. (a) A diffuse inflammation affecting large areas, characterized by extensive development of granulation tissue. (b) The formation of a large circumscribed tumor like mass—the solitary or conglomerate tubercle.

Miliary tuberculosis is frequently not seen until just before death, when the number of tubercles may vary from three or four to many. Both eyes are usually involved and any part of the choroid may be affected. The nodules vary in size and generally project forward raising the retina. The structure seen is generally that typical of a miliary tubercle, that is, giant cells with peripherally situated nuclei, surrounded by epithelioid cells, often with two nuclei. There is also a peripheral zone of mononuclear leucocytes. The giant cells may contain pigment granules, and the center of the larger tubercles is often caseous. The choroidal stroma disappears inside the nodule with the exception of occasional patches of pigment. Most vessels in the affected area undergo endothelial proliferation and degeneration of their walls whereby they are finally

obliterated. The resulting malnutrition accounts for the caseation. The tubercle may start in any layer of the choroid. The number of tubercle bacilli found varies. In Fig. 5, plate XIV, note:

1. The marginal vessels are dilated.
2. The peripheral zone of lymphocytes.
3. The giant cells.
4. The endothelial cells within the lymphocytic zone, and within the margin of the tubercle.
5. Caseation. This is not a young tubercle because there is too much caseation, and the giant cells are too near the periphery. Fig. 6 plate XIV.

Chronic tubercle of the choroid is seen as a diffuse inflammation (noted often, in the postmortem room, in the brain), or as a solitary or conglomerate tubercle. The latter is a very rare condition.

Ossification or bone in the choroid is the final stage of degeneration of the organized deposits of plastic choroiditis. It is therefore found in any of the conditions which give rise to wide spread chronic choroiditis, and is especially frequent in cases in which cyclitis has been the prominent early feature. It occurs at all ages. The time taken is at least some years. In old cases the whole of the choroid may be ossified and changed into a shell of bone. Bone in the choroid is never developed thru cartilage, but is always of the periosteal type. As regards the different views as to the origin of the osteoblasts Stöhr, quoted by Whiting, says, "They are embryonic cells with a tendency to bone formation which deposit themselves by preference at points involved in such metamorphosis. These are presumably conveyed to the eye from the periosteum of the orbit or some other region. Single connective tissue fibers become calcified, and on them are deposited osteoblasts, originating from embryonic cells and forming bone." Reid and Zurbranan have expressed the view that connective tissue corpuscles are converted into real bone corpuscles. Fig. 7, plate XV.

SARCOMA of the choroid is a rare condition. Fuchs found ninety-one among 137,000 odd cases. The great preponderance occurs after the thirtieth year. Of

259 cases Fuchs found 46 up to, and 213 over thirty years. Its course is divided into four stages, namely preglaucomatous, secondary glaucoma, extraocular extension, metastasis. Metastasis may occur early and is common after excision during the first stage. It takes place by way of the blood vessels and probably varies with the deposition of the vessels in the growth, rather than with its cytologic character.

Metastasis occurs first usually in the liver. The preauricular and neighboring glands are practically never affected. Local metastasis in the eye is very rare, and sarcoma in this respect differs totally from "glioma" of the retina. Metastasis is much more frequently the cause of death than local recurrence, in this again differing from "glioma." In 242 cases (Fuchs) death was due to generalization in 45.

Metastasis by blood vessels is facilitated by the frequency of wallless channels in the primary growth. The normal blood vessels of the eye may also be actually invaded by the tumor cells with the formation of vascular thrombi. It is easy to understand how malignant emboli may get free in the general circulation. They are most likely to be filtered off in the small capillaries of the liver, and it is here that metastatic deposits are most common.

There are two types of tumor, circumscribed and diffuse. The latter are very rare. The so-called spindle celled are by far the most common in the uveal tract; forming about one-half the total cases. The cells vary in size, and much resemble embryonic connective tissue cells, having a large nucleolus, and a fusiform cell body, the ends of which often bifurcate. The cells are usually closely packed together forming bundles which cross in various directions and interlace. There is little or no stroma.

The round cells are named more from the shape of their nuclei than from that of the cell protoplasm. They show every gradation in size passing insensibly into the large round cells which are epithelioid with oval faintly staining nuclei, containing one or more well marked nucleoli. The round cells, especially the small type, usually lie in a well marked

reticular stroma. Round cell sarcomata are commoner in the nonpigmented group and are derived from the choriocapillaries (Knapp). This is denied by Fuchs, who maintains that all sarcomata of the choroid originate in the outer layer. Round celled sarcomata grow more quickly than the fusiform or mixed types, and are always very vascular.

The new formed vessels are simple endothelial tubes, with a wide lumen. Ordinary sections give but a small idea of the vascularity of the tumor as the channels and capillaries are often empty and may easily be passed over unnoticed. Hemorrhages and products of degenerated blood clots are commonly seen. When the distribution of thin walled vessels and blood spaces is very pronounced, the tumors are sometimes called telangiectatic or cavernous. Hemorrhages are particularly common in these and early metastasis is the rule. Also, an alveolar arrangement is frequently seen and may arise from various causes, the sarcoma carcinomatoides of Virchow. In some cases cells are arranged very regularly in layers around thin walled vessels, so that a tubular structure is seen. These form the group of so-called angiosarcomata, and in sections they have a superficial resemblance to "glioma" of the retina. Fig. 8 plate XV.

Pigmentation lies chiefly in the cells, less frequently as isolated or clumped granules between the cells. The distribution is usually irregular, parts of the tumor being melanotic, parts being non-pigmented. The pigment is derived from two sources (1) preformed pigment (2) directly from the blood. The origin of the pigment has been much discussed. The preformed is a product of cell metabolism, and only those cells can produce pigment, that are the offspring of pigmentiferous cells. Ribbert regards the chromatophores of the choroidal stroma as the sole source of the cells. Langhans and Gussenbauer first asserted a purely hemic origin for the pigment. This view has been wholly or partially accepted by recent writers. Primary sarcoma of the choroid might conceivably arise from either of the layers of the choroid or from any of the

fixed cells within it. Chromatophores are often massed, chiefly near the base and at the periphery of the tumor or in definite patches. They are then closely packed and deeply pigmented so that these parts of the tumor appear coal black to the naked eye. In other words they lie amongst nonpigmented spindle, or star shaped, or round cells.

Flat or diffuse sarcomata of the uveal tract are extremely rare. The most conspicuous feature in their histories is the long duration of the disease, extending from seven months to ten years. These tumors are characterized by their tendency to diffuseness and infiltration as opposed to the formation of a definite tumor. Figures 9 and 10, plate XVI show a small sarcoma of the choroid. It is situated in the posterior border of the globe at one border of the optic disc, marked by a small deeply pigmented elongated area. It is posterior to the retina and in the anatomic situation of the choroid. Microscopically, one sees the tumor has replaced the choroid as far as the retina, pushing the latter before it. At each pole the tumor gradually thins out and has extended on one border beyond the margin of the optic nerve. The tumor is rich in blood vessels which are large and dilated. The individual tumor cells are spindle shaped, compact and contain pigment. There is no evidence of local metastasis. Fig. 11, plate XVII.

Situated in the choroid, immediately opposite and extending outward to each side of the optic disc, one sees an elevated sharply defined elliptical mass, which measures about 2 c.m. in length, and one-half c.m. in thickness. Anterior to the tumor the retina is seen to be detached. Microscopically, one sees the tumor is (1) rich in cells, (2) there is very little stroma, (3) it is not very vascular, and the blood vessel walls are very thin.

The tumor is situated between the sclera and retina; the latter is definitely pushed forward by the tumor mass. The choroid in this area has been destroyed. The margins of the tumor, even microscopically, are sharply defined. At one pole of the tumor widely dilated blood vessels are seen. The

relation of the tumor to the optic nerve is of interest. 1. It covers the optic disc, and 2. the thickest part of the tumor is opposite the disc, i.e., the oldest place. The individual cells are definitely spindle shaped, their nuclei are large and prominent. Some have definite nucleoli. A few mitotic figures are seen. There is marked edema of the optic nerve, and in the superficial layers of the sclera, situated near the entrance of the optic nerve, there is a small group of compact cells which in their morphology resemble the cells of the tumor. A few cells here and there thruout the tumor contain pigment, while others which resemble in morphology tumor cells contain fine granules of pigment. Figures 12, plate XVII, and Fig. 13, plate XVIII.

CARCINOMA of the choroid is always secondary, as there is no epithelium in the choroid from which a primary tumor might spring. The primary growth is generally in the breast, and the left eye is more frequently involved than the right. The choroid is almost always attacked in the posterior part. The predilection of the posterior part and temporal side is accounted for by the distribution of the blood vessels. The progress of the growth is rapid, vision soon fails from complete detachment of the retina. Lungs, liver, meninges, soon become involved, with death quickly following. In the majority of cases death occurs in a few weeks or months; life may extend to two years but this is very unlikely. The retina is usually detached over a large area, and this is considered of some diagnostic importance. The histology depends upon the nature of the primary growth. Fig. 14, plate XVIII.

Figure 14 is a specimen from J. A. MacMillan. A large part of the one half of the globe shows a dense new growth, which is attached to the inner lining and projects into the globe as a

solid mass. The denser areas, as shown by the high power, represents well preserved tumor cells; while the paler areas, which constitute the larger part of the specimen, represent necrotic tumor tissue. The tumor cells here preserved show in many instances that they are present as a collar about the blood vessels. The retina and choroid have been destroyed and replaced by tumor, the sclera is very little involved and the line of demarcation is sharp. With high power it is seen that the greater part of the tumor is represented by necrotic tissue, and that the best preserved portions are either at the base of the tumor, that is at the point of attachment to the sclera, or about the blood vessels. The latter are comparatively large, widely distributed, with thin walls. Mitotic figures are seen here and there. Fig. 15, plate XIX.

The tumor in this specimen is seen in the posterior half of the globe near the optic disc, extending anteriorly as a narrow oval mass. Its anterior margin is separated from the retina by a ribbon like band of hemorrhage. The optic nerve is not involved. Histologically, the tumor is seen to have replaced the choroid, and to have infiltrated the most superficial layers of the sclera. Anteriorly the margin of the tumor is very sharply defined. The tumor consists of a great number of multinucleated cells imbedded in a comparatively rich stroma in which there are small blood vessels and numerous lymphocytes. Fig 16, plate XIX.

The tumor cells appear to consist of masses of protoplasm which contain many nuclei.

I have much pleasure in acknowledging my thanks to Dr. L. J. Rhea, the director of the laboratory, for his supervision; and also wish to say that some of these specimens are not my own, but have been in my collection so long it is impossible to acknowledge their source.

TRICHINOSIS WITH PREDOMINANT SYMPTOMS REFERABLE TO EYES AND FRONTAL SINUSES.

JEROME B. THOMAS, M.D. AND WARD COOPER, M.D.

PALO ALTO, CALIF.

In the case here reported, the striking symptoms were exhibited in the lids and orbit, with pain in that region. The diagnosis was suggested by blood examination and confirmed by microscopic study of tissue taken from a muscle. Literature cited shows that cases with marked ocular symptoms are not rare.

Trichinosis is rare in California; but when it does occur there is a fair chance that the patient, on account of the predominant severity of special symptoms, may first consult the ophthalmologist or rhinologist. The case here reported comes under that category and a description of it may be of interest, and serve the useful purpose of reminding us that there is no sharp line of demarcation between general medicine and the specialties. There were complications too, which lead in the direction of false conclusions and gave added interest to the pursuit of the primary cause of the disease.

CASE

H. H. R., male, 35 years, consulted us October 30, 1923, on account of edema of the eye lids and pain in the frontal region. He gave a history of having been out of sorts for three weeks previously, with sore joints and muscles, and feverish attacks which he attributed to influenza.

The upper and lower lids of both eyes were edematous and there was marked chemosis of the bulbar conjunctiva. Vision was normal. The eyegrounds were normal. The nose and throat were negative, except for slight catarrh.

October 31. There was such severe frontal pain during the night that a hypodermic of morphia was required to give relief. The eye lids were swollen tight shut, so that it was difficult to obtain a view of the cornea. This condition was complicated by the fact that the baby scratched the patient's right eye early in the night, and this eye was the more painful. There was some edema of the cheeks over the malar and temporal regions. The upper lids were tender to palpation, especially the right. His temperature was 103° F. The lids could not be separated enough to permit inspection of the cornea. The patient was sent to the hospital.

The X-ray plates showed decided opacity over the site of the right sphenoidal sinus, the same side as the more painful eye. All sinuses including the frontals were fuzzy and indistinct in outline, suggesting acute catarrhal congestion, or edema, of the lining membrane. Orbital abscess was suspected; also empyema of the right sphenoidal sinus.

November 1. Washings from the right sphenoidal sinus clear. Eyegrounds remain normal. Within four hours after the sphenoidal irrigation the patient had decided relief, both from general discomfort and the ocular edema and pain. The edema was so much reduced that he could open his eyes halfway, for the first time in 24 or 36 hours. It was noted however that this improvement occurred soon after a free bowel movement induced by a large dose of salts, and hence could not be attributed with any certainty to the nasal treatment. Indeed the absence of visible discharge in the sphenoid washings made it necessary to seek the causative agent elsewhere.

November 2. Edema improved, but frontal pain and muscle pain continue. Temperature 103° in A. M., remitting in P. M. Profuse night sweat. Blood count showed the following: Leucocytes 19,650, lymphocytes 6%; large mononuclears 3%; polymorphonuclears 61%; eosinophiles 30%. This very high percentage of eosinophiles suggested intestinal parasitism. A history was then elicited of the patient having eaten corned pork in San Francisco about a month ago. Returned to his home and was treated symptomatically. Improvement slow but steady.

November 3. Blood count showed leucocytes 18,575, lymphocytes 14%; large mononuclears 2.5%; polymorphonuclears 47.0%; eosinophiles 36.5%.

December 4. Able to walk about; but

still complains of lameness in leg muscles, especially the calves, and sweats freely every three or four nights. A bit of muscle tissue from the gastrocnemius was submitted to Prof. E. W. Schultz of Stanford University, for examination, who reported the presence of numerous encysted trichinae, as follows:

December 4. A piece of gastrocnemius muscle measuring 1 c.m. in length and 0.5 c.m. in thickness. Embedded in celloidin and stained with H and E. On histologic examination, the muscle presents numerous encysted trichinae. The invasion appears to have been recent. There is a wide cellular zone composed of fibroblasts, lymphoid cells, eosinophiles immediately surrounding the cyst. The cyst wall itself is delicate. Within the cyst lie the coiled worm, a finely granular albuminous material, and occasionally young muscle cells. Proliferation of muscle nuclei is prominent in the cellular zone surrounding the cysts. The young muscle cells are basophilic and contain large oval vesicular nuclei, each of which contains a large nucleolus. In addition to these multinucleated protoplasmic masses surrounding the cysts, there are occasionally typical foreign body giant cells. Eosinophiles and round cells are also found between individual muscle fibers and in the supporting tissue.

SYMPTOMATOLOGY AND DIAGNOSIS.

1. Osler considers edema of the lids one of the three characteristic symptoms of trichinosis, the other two being leucocytosis with eosinophilia and muscular pain and swelling. The ocular edema is probably due to myositis of the extraocular muscles, surrounded by the relaxed areolar tissue of the orbit.

2. Four out of six cases of trichinosis, reported by F. J. Parker¹, sought advice on account of eye symptoms. Edema of lids was reported in one-fourth of 52 cases of W. G. Thompson.²

3. Three cases were reported by E. L. Pratt,³ whose presenting symptoms were pain in the region of the eyes and frontal sinus, and more or less edema of the lids.

All had eosinophilia varying from 20 to 22%.

4. Subcorneal (subconjunctival) ecchymosis. 1 case reported by C. Strauble and 8 cases in 264 reported by Kratz. 3 cases in 52 reported by W. G. Thompson.²

5. One case of optic neuritis with numerous retinal hemorrhages in both eyes, and another with vision temporarily affected, reported by W. G. Thompson.²

6. Differential diagnosis. It may be confused with paranasal sinusitis, orbital abscess, lacrimal adenitis, rheumatism, influenza, typhoid or malarial fever.

7. A careful study of 52 cases by W. G. Thompson is worth summarizing. The patients were seen during 6 years at the Bellevue and Presbyterian Hospitals in New York City. Incubation 2 weeks (9-21 days). Trichinae never found in stools. Pain in arms, calves, thighs and eyes. Profuse sweating. Cough in many cases. No trichinae in sputum. Dyspnea common, often due to invasion of diaphragm, evidenced by soreness over abdomen and by thoracic breathing.

Leucocytosis not over 15,000 in $\frac{1}{3}$ of the cases, maximum 40,000.

Eosinophiles over 40% in 13 cases.

Eosinophiles over 20% in 31 cases.

Eosinophiles over 81% in 2 cases.

Eosinophilia affords no accurate index of the severity of symptoms. Trichinae found in muscle in 29 cases, and in 18 cases no examination, or examination negative. Acute myositis in 5 cases.

In 4-5 cases, there was a return of temperature and symptoms after 3-4 weeks of apparent recovery.

Only 2 deaths occurred in the series.

REFERENCES.

1. Parker, F. J. Eye Symptoms of Trichinosis. *Med. Record*, 1907, p. 179.
2. Thompson, W. Gilman. Trichinosis. A Clinical Study of 52 Sporadic Cases. *Am. Jour. Med. Sci.*, 1910, v. 140, p. 157.
3. Pratt, E. L. Trichinosis Simulating Sinusitis (With Eye Symptoms). *J. A. M. A.*, 1915, v. 65, p. 1277.

A CASE OF TRAUMATIC ANIRIDIA.

W. E. SCOTT-MONCRIEFF, M.D., F. R. C. S. Ed., Lt. Col. I. M. S. (Retired).

VICTORIA, B. C., CANADA.

The case here reported is remarkable for the excellent recovery of the eye. This is commented upon with similar cases, previously recorded. A suggestion is quoted that removal of the whole iris might be advisable in some cases of chronic inflammation.

On 11th October, 1920, at 3 a. m., I was called to see S., male, aged 66, who had struck his eye against a chair. I saw him within an hour of the occurrence. As usual when I treat a case at the patient's home my notes are scanty; they are as follows:

"A. S., 66 years, general health good, Struck his right eye on a chair. Vision—finger counting. Iris and probably part of ciliary body lying on the sclera on nasal side of cornea. Blood in anterior chamber; and above the hyphema a small clear area thru which fundus reflex is seen. Lens shown to be in situ by Sanson's images (subsequently this was proved to be wrong). Eye not notably soft; no pain."

Nov. 12th seen at my office. O. D. still slight injection: vision not noted: O. S. V. $5/6$ partly, no improvement: + 2.5 D. S. J. 2, + 3. 5 D. S. Jaeger 1. Ordered this for left eye.

Dec. 15th. O. D. quiet: Iris lying under conjunctiva: it has lost some of its color. Lens not in situ as shown by Sanson's images test. O. D. with + 11. D. S. V. = $5/5$, missing a few letters, with + 14. D. Jaeger No. 1. Ophthalmoscopic examination, with + 11 D. Fundus, well seen, is normal. Floating opacities in vitreous; lens not seen."

Jan. 22nd, 1924. O. D. V. with + 11. D. Sph. = $5/5$, and $5/4$ partly; with + 14. D. S. Jaeger No. 1, eye quiet. Shape of eyeball is normal, except for an extrasceral bulging on the nasal side no greater than in Dec., 1920. The greater part of this prominence is formed by the iris. It is of a rich brown color and is above the horizontal meridian. Just below the horizontal there is a smaller prominence, which may be the lens. No healed wound of the sclera can be made out. The cornea is normal but there is a very marked arcus senilis; and, owing to the absence of the iris, the fundus reflex is beautifully seen thru the ring of clear cornea between the arcus senilis and the limbus. A few strands

of brown iris can be seen crossing the anterior chamber (or what was the anterior chamber); these oscillate when the eye moves. At a deeper level can be seen several strands of what is presumably lens capsule. The ciliary processes are seen at the temporal edge only, 15 of these can be seen. Around the rest of the periphery no structure can be seen between cornea and retina. There is no trace of the lens to be seen. Flattening of the circumcorneal groove, described in Parson's Pathology of the Eye, as an occasional result of such injuries, is not present. Tension is normal by finger test."

I have no written record of the case from 11th Oct. to 12th Nov., 1920, during which period I saw him pretty frequently at his home. His daughter, a trained nurse, carried out the treatment, which consisted of rest, and an occasional drop of argyrol solution to keep the conjunctival sac clean. The blood was absorbed fairly quickly and there was little suffering, mental or physical.

Apart from the rarity of the injury and the astonishingly favorable result, the interesting part of the case to me is the fact that after my first examination I was on the point of giving a very bad prognosis; with a preliminary mention to his relatives of early enucleation being probably necessary, when the patient's natural objection to losing his eye should be overcome by pain and worry. Then, luckily for my reputation, I vaguely remembered having recently read something on similar cases in which the end results were good.

At 3 o'clock in the morning my brain was acting slowly, but on the way home my recollection became clearer and I found and read the article before going back to bed. It appeared in the British Journal of Ophthalmology, v. 4, p. 412, and is entitled "Three cases of total removal of iris" by D. J. Wood, Capetown, So. Africa. I had, on receiving the journal, rapidly glanced thru it

and put it aside for further perusal. My thanks to Doctor Wood; for his article saved me from giving a wrong prognosis; and it is readily conceivable that had there been more delay in absorption of blood and more distress physical and mental I might have enucleated the eye. Many of us are reluctant to publish cases which are chiefly remarkable for their rarity; but the three cases reported by Wood and now this case of mine are certainly worth publishing if only from the prognostic aspect.

Do I overemphasize the importance of prognosis? Is not much of the success, or shall I say, prevalence of quackery due to neglect of this branch of the art of medicine? I would like to hear

this subject discussed at a Medical Society meeting.

For the benefit of those who have not access to the report by Wood that I have referred to, I may say that his first two cases were very similar to my case; there being complete removal of the iris with, in both cases, $V.=6/9$. In the third case, one of chronic iritis with "iris bombe," the iris was removed complete, during an iridectomy operation, and the eye quieted down quickly and there was no more inflammation. Wood concludes his communication with the suggestive remark: "It would appear that in some cases of obstinate chronic iritis the total removal of a thickened iris is not merely easy, but is very effective as a cure."

VALUE OF RADIATION THERAPY IN OPHTHALMOLOGY.⁶

SANFORD WITHERS, M.D.

DENVER, COLO.

The ocular resistance or susceptibility to radiation is first considered. Conditions for which treatment by radiation is the method of choice are taken seriatim. Next conditions in which radium is of proven value but not necessarily the method of choice are discussed. Conditions in which radium may be used, because causing less trauma, are important. Then conditions in which radium may be applied as an experiment, because beneficial in similar conditions of other parts, are mentioned. Finally, the use of radium as a prophylactic or as a palliative method is treated.

During the past few years our knowledge of the biophysical and clinical action of radium has been rapidly increasing. With this, the problem of treatment has become largely one of more accurate radium application. At present, short wave length therapy is the greatest single agent at our disposal in combating cancer. It should not, however, be considered a cancer cure, in that the treatment of malignancies is not directed at the constitutional disability, or exciting cause.

The use of radium salts in small tubes to facilitate the introduction into a tumor mass is certainly a great advance over surface radiation alone. If sufficient needles are available to permit it, a uniform distribution can be made.

The use of filtered radium as an adjunct to surgery has a certain limited usefulness, and the placing of filtered radium within a surgical field certainly brings the element in closer proximity

to the seat of disease than external radiation.

With the advent of radium therapy by means of radium emanation, a new possibility was presented, that of burying small tubes of emanation interstitially and leaving them permanently in place. From the standpoint of trauma, this method of introducing radium, in many cases, carries with it less danger than any of those previously mentioned and permits of a more uniform distribution of the radiating foci, to furnish a more intense dose of radiation exactly where it is desired.¹

CELLULAR CHARACTERISTICS DETERMINING RESISTANCE OR SUSCEPTIBILITY TO RADIATION.

Regardless of its future, as a therapeutic agent, one of the permanent contributions of radiation therapy has been the demonstration of certain biologic properties of tissues, which were pre-

viously unrecognized. It was observed that certain tissues were *resistant* to even large doses of radiation, while others were quite *susceptible* and underwent resolution or retrogression with remarkably small units of beta, gamma or X-rays.²

In general, there are five structural characters which determine susceptibility to radiation. All are of a cellular nature.

1. Undifferentiated form of cells.
2. Rapid growth with abundance of mitoses.
3. Large, hyperchromatic nuclei.
4. Vascularity, especially when due to an abundance of thin walled capillaries.
5. Absence of stroma, or intercellular substance.

In addition to these, it may be said that *secreting cells* are in general more radiosusceptible than nonsecreting cells.³

It was the presence of this histologic picture, wholly or in part, in tumors which responded quickly to radiation, that led certain authors to assert that radium was selective in its action for certain types of cells.

On the other hand, tissues prove relatively *unsusceptible* when the cells are differentiated, adult in structure, and contain small amounts of chromatin in the nucleus; when they grow slowly and mitoses are few; when the blood supply is thru well formed adult vessels and when there is much intercellular material, or stroma.

There is a long range of radiosensitivity for animal cells, ranging between the most radiosensitive (such as certain sex and leucocytic cells) and the least radiosensitive (such as muscle cells and nerve fibers). The radiosensitivity, too, is a property of the nucleus, and is inherent to certain states or temporary physiologic periods of cell life, the most important of which is the state of reproduction. Arguing from these premises, Regaud⁴ asserts the X and gamma rays of very short wave length are elective poisons for nuclear chromatin. Hence the rays suppress or suspend reproduction in certain tissues, which are likewise shown to be highly radiosensitive.

With the foregoing criteria of radiosusceptibility in mind, it is possible to bring to a review certain pathologic processes occurring in the practice of the ophthalmologist, and to state whether or not such conditions should be amenable to radium therapy, on theoretic grounds. We will see that the practical results substantiate our theorizing in every case.

In the following paragraphs, we shall discuss pathologic conditions, grouped according to the degree of their radiosensitiveness.

I. CONDITIONS FOR WHICH TREATMENT BY RADIATION IS THE METHOD OF CHOICE.

1. Basal Cell Carcinoma.
2. Epithelioma of the Cornea—Corneoscleral juncture.
3. Undifferentiated Sarcomas, including Glioma, Lymphosarcoma and Giant Cell Sarcoma of the Orbit.
4. Myeloid and Lymphoid Deposits, including Chloroma and Hodgkin's Disease.
5. Angiomas including Hemangiomas, Cirroid Aneurysms, Port Wine Stains, Vascular Nevi, Lymphangiomas, and Lymphangioma Tuberosum Multiplex.
6. Spring Catarrh (vernal conjunctivitis).

It is apparent, without reviewing the histologic structure of these conditions, that each has the characteristics of radiosusceptibility to a marked degree.

1. *Basal Cell Carcinoma.* At the risk of being somewhat tedious, we shall discuss the occurrence and more recent ideas of the structure of epitheliomas, in particular regard to carcinoma basocellulare.

The following paragraph is quoted from Broders and MacCarty of the Mayo Clinic:⁵ "The term epithelioma, as the name implies, is a tumor composed of epithelium without any distinction relative to clinical malignancy or benignancy. . . . The term as utilized in this paper refers only to tumors of the epithelium of the skin, the glandular structures which are a part of it and other structurally similar tissues, altho the subject matter does not include such benign epitheliomata as warts,

moles, corns, leucoplakias, epithelial horns, etc."

Of vital interest to ophthalmologists is the fact that over 25% of all basal cell carcinomas involve the canthi or lids of the eyes, and about 3% of all prickle cell carcinomas involve these structures. In about 12% of the cases, there occur multiple nodules.

Clinically, these basal cell carcinomas are well known to be slow growing, pearly, rose colored, smooth nodules, with semitranslucent appearance, tending to occur singly or in multiple at the site of some slight traumatism or infection in individuals having senile hyperkeratotic areas in the region of the lids. The lesions tend to appear about the outer or inner canthus at a little distance from the ciliary margin; very few nodules begin at the center of the lids.

Crater like ulceration is the rule, by the time growth has attained a size of 5 to 6 millimeters, following which the growth becomes more rapid and the lesion increases markedly in thickness.

In many instances, daughter nodules form about the margin so that the growth appears as a pink rosette of 2 to 3 centimeters in diameter, with a central crater of ulceration covered by a hemorrhagic crust. As a rule they show little or no infiltration or tendency to metastasize.

Surgically, growths of the lids are most difficult to deal with satisfactorily, as the removal of even small nodules often causes distortion of the marginal contour, and in those instances requiring the removal of over one-half the lid margin, or either angle, there is little or no hope of restoring normal function to that eye.⁶

In speaking of inferior blepharoplasty, Maj. J. D. Gillies states⁷, that, "where the loss of the lid edge is one-third or less, a very satisfactory repair can be made, but when the whole lid has been destroyed, the operation results, seen by the author, are considerably wanting in finish." If this is true for the repair of the lower lid in the hands of experts, then it must be almost impossible to supply a movable upper lid.

In general, then, surgical procedures,

removing the greater portion of either lid, sooner or later demand an enucleation to free the patient from the irritation, infection and discomfort of an exposed globe.

2. *Epithelioma of the Cornea.* This type of malignancy most frequently arises at the corneoscleral juncture as a slow growing, tiny, pink rosette of fairly firm consistence, usually painless or accompanied by very little pain; yet noticed very early in its course by the patients who usually seek medical attention early. Epithelioma of the cornea is usually made up of cells resembling those found in the basal layer of the mucous membrane and metastasis is usually late in their course.

These growths should be treated with relatively unfiltered radium in cauterizing doses—accurately applied.⁸ The treatment should be completed at one sitting in order to minimize the amount of fibrous tissue produced in the cornea. The cornea is from ten to fifteen times as radioresistant as the epithelium of the lids, hence will not perforate readily.

3. *Undifferentiated Sarcomas.*

(a) Gliomas.

"Of all tumors of the brain and spinal cord, glioma, in its various forms, presents most of the structural features that favor susceptibility to radiation. They are cellular, sometimes extremely so; the cells are of delicate structure and labile chemical constitution, which renders them very prone to autolysis and liquefaction; the blood vessels are numerous and very fragile, and the tumors are notably subject to hemorrhage and necrosis. They are by far the most frequent brain tumor, forming 55% of all tumors, including fibromas, cysts, and tubercle. On the whole, I know of no tumor which, on *a priori* grounds, ought to yield more readily to moderate radiation than the average glioma."²

(b) Lymphosarcoma, large and small round celled sarcomas, and leucosarcoma.

The regression of this type of tumor to radiation nearly approaches the miraculous. We have seen huge, bulky tumors disappear with such rapidity

(within a few days) and with such marked shrinkage of the skin as to make it impossible to give all the skin areas that had previously been marked out the dosage that had been calculated they should receive. This is just the reaction one should expect from growths having all five of the characteristics, making for radiosensitivity.

(c) Giant Cell Sarcomas. Of this clinically benign growth Ewing states as follows:⁹ "For a successful result, it is highly important that the skin and tumor capsule should not be incised for diagnosis, since the scar may break down under repeated radiation, and infected cases as a rule do badly. The insertion of radium tubes into the cavity after curettage is not a very satisfactory method, since such radiation renders the tissue more susceptible to infection, and adequate dosage may cause chronic osteitis or bone necrosis. The best method is external radiation through the intact skin. The capacity of the physical agents to deal successfully with the various forms of the benign giant cell tumor is clearly dependent on the cellular structure and delicate blood vessels of the tumor tissue."

4. *Myeloid and Lymphoid Deposits.* Including chloroma and Hodgkin's disease.

These infiltrations, as a rule, accompany the generalized involvement and demand similar treatment to the lesions in other localities. Within the past few years there have been several reports^{10 11 12} of three to five year regressions in cases of leucemia and Hodgkin's disease brought about by radium and X-rays or a combination of the two.

5. *Angiomas.* Including Hemangiomas, Cirroid Aneurysms, Port Wine Stains, Vascular Nevi, Lymphangiomas, and Lymphangioma Tuberosum Multiplex.

These were among the first lesions treated with radium, and there is such an extensive literature on the subject that it is unnecessary to call further attention to these conditions here. The results are, as a rule, admirable, even in the hands of the inexpert. Very

small doses suffice to retard or stop the growth and the endarteritis which is so readily initiated frequently continues for months following the treatment.^{13 14 15} In the treatment of bulky growths, surprisingly good results have been obtained by burying tiny glass spicules of radium emanation into the depth of the mass near the probable ports of entry of the main vessels.

6. *Spring Catarrh (Vernal Conjunctivitis).*

This rather uncommon condition was discouraging alike to physician and patient, until it was found that the granulations could easily be caused to disappear under beta radiation. The regression of this condition illustrates the reaction of granulation tissue in general to radiation.^{15 16 17} Many writers have previously reported successful results.

II. CONDITIONS IN WHICH THE USE OF RADIUM IS OF PROVEN VALUE BUT NOT NECESSARILY THE METHOD OF CHOICE.

1. *Adenoid Cystic Carcinomas* of the salivary gland type, arising in the skin and lacrimal apparatus.

This type of growth is much more common than is generally conceded and accounts for some of the startling cures of tumors misdiagnosed as sarcomas. They belong to the group of basal cell carcinomas and, therefore, show little tendency to metastasize. The cells are small, often arranged in alveoli, and contain markedly hyperchromatic nuclei. The stroma is scanty. The following conclusions are taken from Johnson's recent publication on the occurrence and treatment of these lesions:¹⁸

"1. Adenoid cystic epitheliomas of the salivary gland type, occurring about the face, are not as uncommon as the literature would indicate. Such neoplasms have been reported, but not properly recognized, and histologically interpreted.

"2. The tendency is to regard them as sarcomas. To this fact may be attributed some startling surgical cures.

"3. The characteristic tumor has slight malignant properties. Therefore it does not ulcerate and invade in its early stage.

"4. Radium treatment has been entirely successful in these cases."

2. *Prickle Cell Carcinomas.*

About 3% of all prickle cell epitheliomas involve the canthi or lids of the eyes. It is often difficult to determine whether an epithelioma should be called a basal cell or squamous cell epithelioma, especially since prickle cells are found in so-called basal cell epitheliomas, and basal cells can always be seen in the squamous cell epitheliomas. It now seems to be a well established fact that a carcinomatous growth, made up largely of basal cells can change into a typical carcinoma spinocellulare or, at least, into an epithelioma in which the prickle cells predominate. We know, beyond a doubt, that basal cells and prickle cells may be shown intimately connected in a neoplasm, and this may account for the contention of some pathologists that basal cell epitheliomas do occasionally metastasize.

The point to be kept in mind is, that there are all grades of malignancy, from the relatively benign hornifying types of slow invasive growth, to the completely *undifferentiated*, rapidly growing and metastasizing structure designated by MacCarty as "type four."

3. *Sarcomas and Orbital Melanomas of Differentiated Cell Structure*, including Fibrosarcomas, Adenosarcomas, not including Chondromas or Osteomas.

The treatment of relatively differentiated sarcomas (particularly slow growing tumors having abundant well formed stroma) by radium or X-ray usually brings discredit to the method, unless such treatment is carried out in connection with surgical excision, or destruction. It is an interesting fact that about one-third of *all* melanomas originate in the choroid.^{20 21}

It has been observed that melanomas involving normal skin are only slightly more vulnerable than such epithelium to radium. In the treatment of such conditions, then it is advisable to make intensive intratumoral applications of radium, in the form of needles or bare tubes of emanation.

4. *Actinomycosis, Blastomycosis.*

Heyerdahl²² reported six cases of actinomycosis treated with radium, ranging in duration at the time of treatment

from one week to four months. All these cases were reported as being permanent cures without any sign of recurrences after various periods of time up to six years. The most recent article on this condition is the extensive publication by New of The Mayo Clinic. Radiation therapy should be used as an adjunct to the usual medical treatment by iodides.

5. *Lupus Vulgaris and Lupus Erythematosus.*

When these conditions occur in the usual butterfly pattern, the eyelids and inner canthus are always involved. In treating such conditions the use of the older methods, phenol, carbon dioxide snow or the actual cautery are precluded by the delicate structures encountered. In these cases, radium has been proven to be the method of choice in all but the acute fulminating conditions. Small doses of radiation are of particular advantage in the chronic atrophic changes, especially where there is presumptive evidence of malignancy developing upon the lupus base.²⁴

III. CONDITIONS IN WHICH RADIUM MAY BE USED WHERE MORE TRAUMATIZING PROCEDURES ARE CONTRAINDICATED.

1. *Cataract.*

In a paper entitled "The Action of Radium on Cataracts," presented by Martin Cohen and Isaac Levin at the Ophthalmological Section of the American Medical Association on June 12, 1919, it was indicated that in incipient cataracts the lenticular opacifications may diminish under the influence of radium. Should a cataractous lens become matured subsequent to radium treatment and should an operation then be required, no technical difficulties will present themselves as a result of radium treatment. It was also proven by the authors that the application of radium in much larger doses than required to cause a retrogression of the cataract, is harmless to the normal tissues of the eye. In view of these results it is probable that before long many radium therapists will be called upon to treat cases of incipient cataracts with radium. In order to form a true estimate of the value of this method of treatment, it is imperative that a correct and uniform technic be developed.

It is remarkable that in ophthalmology, even in the most recent publications, the methods reported still consist in the application of soft unfiltered rays. Koster (cited by A. F. Mattice,²⁵) who treated with radium a large number of cases and a great variety of eye diseases, used a glass tube filled with radium which he placed uncovered and unprotected in any way directly upon the scleral conjunctiva. Knox,²⁶ in his latest edition of *Radio-Therapeutics*, still recommends exposures with unscreened radium. Such methods are dangerous, since the soft unfiltered rays irritate and burn the immediately adjacent normal tissues—conjunctiva, cornea—without influencing the deeper lying abnormal tissue, the cataractous lens.

The method employed by the above writer in the treatment of cataracts is similar to the technic of deep radium therapy which he is using at present in the treatment of malignant tumors and various other conditions.

"The application lasts two hours and the quantity of radium used about 25 milligrams of element. At the beginning of the treatment much larger quantities of radium were employed without injury to the eye, but the smaller quantities appeared to be quite as effectual. The treatments are repeated at first every week, and later at longer intervals, in accordance with the results of the ophthalmologic examinations. The treatment, once in two to four months, should be continued for at least two years, since the cataract is a slowly developing disease."

Other operators as well as the writer will undoubtedly modify and improve the methods as the work goes on, and in a few years the results should be checked and a definite conclusion reached as to the value of this method in the treatment of incipient cataracts.

In two papers by Franklin and Cordes,^{28 29} they confirm the work of Levin and Cohen on the action of radium on cataracts (83% of the cases treated showed improvement) and recommend this method for the treatment of all incipient senile cataracts.

2. Pterygium.

In an article by the writer⁶ in *The American Journal of Ophthalmology*,

January 1921, attention was called to the fact that cauterizing doses of radiation, which were given for carcinomas about the eyelids, rapidly caused the disappearance of pterygia, some of which recurred, but many of which retrogressed completely.

3. Nevus, Papilloma, Xanthelasma, (Xanthoma Palpebrarum).

There is very little choice between the radium treatment of nevus, papilloma and xanthoma palpebrarum and their surgical ablation, except in the presence of bulky growths, the excision of which would probably cause a distortion of the normal contour of the lids. Papillomas are particularly susceptible to radiation in any location. Nevus and xanthelasma require considerably larger doses.

4. Cicatrices (Scar Contractures) and Keloids.

Attention has been previously called in this report to the fact that scar tissue appears to be more radiosensitive than normal tissue. It is therefore possible to cause a marked softening in old scar contractures (including entropion and ectropion) by erythema doses of radiation. This method has repeatedly been used and has gained considerable vogue on the Continent, in connection with plastic procedures for war time injuries.^{14 26}

5. Trachoma and its Complications. Panus and Cicatricial Scarring.

Referring again to the effect of radiation on granulation tissue, poorly formed blood vessels and scar contractures in other localities, is it not reasonable to suppose that amounts of beta radiation applied directly to the conjunctival surfaces, as in the treatment of vernal conjunctivitis, will cause a disappearance not only of the trachoma granulations and papillary bodies, but also obliteration of the vascular tissue of pannus and softening of the cicatricial tissue?

IV. CONDITIONS IN WHICH EXPERIMENTAL APPLICATIONS OF RADIUM ARE JUSTIFIED BECAUSE OF FAVORABLE RESULTS IN PATHOLOGICALLY SIMILAR CONDITIONS IN OTHER LOCATIONS, OR BECAUSE OF DEFINITE EVIDENCE OF RADIOSENSITIVENESS OF THE PARTICULAR CELLS INVOLVED.

1. Phlyctenular Keratitis, Phlyctenular Conjunctivitis (Tuberculosis of the Cornea or Conjunctiva).

Because of the favorable retrogression of tubercles and ulcerating tuberculosis of mucous membrane surfaces, and because of the histologic character of the ulceration and infiltration, it appears to the writer to be a justifiable experiment to obtain cases for the application of radium in this condition.

Radiation treatment of these conditions is certainly supported by theoretic considerations and deductions from the treatment of similar conditions in other localities.

2. *Keratoconus.*

The standard treatment of this condition is understood to be the use of cauterizing measures to produce a scar tissue contracture of the cornea. With this in mind, would it not be possible to produce such contractures without as dense scarring (as is produced by the cautery) by means of beta ray applications to the projecting cone? The scars resulting from radium applications to the cornea have been found to be uniformly less opaque than scars from escharotics or cauterizations. Such radium scarring should then be preferable to the more dense scars.

3. *Chronic Dacryocystitis.*

The treatment of chronic dacryocystitis has been one of the most difficult problems before the ophthalmologist. There have been a number of different methods of treatment put before the profession, but none have proven entirely satisfactory. In selected cases the intranasal method of drainage has been satisfactory. The chief cause of the failure in this method of procedure however has been the closing of the nasal opening due to the formation of granulation tissue. From our experience with radium we know that this granulation tissue could be smoothed down permanently with radium, and this operation made much more successful than in the past.

4. *Metastatic Growths:*

The writer has had the privilege of treating several cases of intraorbital metastases in which there was no possibility of ridding the patient of his disease and treatment was instituted only with a desire to conserve vision until the end.

5. *Radium to Relieve Pain.*

It has been demonstrated many times that radium or X-ray applications, even tho such applications produce no gross effect upon the tumor mass, relieved the patient of the pain from pressure or nerve involvement. This is considered to be a justifiable procedure even though it may not prolong life.

6. *Blepharitis.*

This condition is pathologically similar to folliculitis in other localities (such as scalp, axillae and pubic region) which have been treated so successfully by obtaining a temporary epilation by X-ray or radium. It has been shown that as long as the infected hair follicle remains open, the infection persists, and that with the temporary obliteration of such follicles the infection dies out, without further medication. Would it not be possible, then, to eradicate this chronic inflammation along the ciliary margin by an epilating dose of radiation?

V. CONDITIONS IN WHICH RADIUM MAY BE USED AS A PROPHYLACTIC MEASURE.

1. *Prophylaxis.*

Pre- and postoperative radium applications are indicated, locally and to the glands, particularly in intraocular melanomas and gliomas, combined with radical exenteration of the orbit.

Radiation is also recommended, pre- and postoperatively, in connection with bulky malignancies which cannot be completely destroyed surgically.

2. *Palliative.*

The use of X-ray or radium needs very little comment for hopeless malignancies. More radium applications have been made to these wrecks, than to the early conditions, and it was only thru the occasionally favorable retrogression of an otherwise hopeless condition under radium that we feel justified in recommending radium for the more favorable conditions.

Note: It is easily apparent that the normal structures of the eye (particularly the cornea, sclera, lens and retina) are histologically radioresistant.

The condition of the normal structures (referring to the presence of scar tissue, infection, ulceration, etc.) has an impor-

tant bearing upon the radiosensitiveness of these structures. Attention is called to the fact that such scar tissue or infection precludes the most favorable result, following radiation, and that in many

cases preliminary surgical procedures, or escharotic applications are not only unnecessary but jeopardize the possibility of a clinical cure by radium, or X-ray.

BIBLIOGRAPHY.

1. Quick, Douglas. The Value of Interstitial Radiation. *Am. J. of Roent.*, vol. IX, No. 3, Mar., 1922.
2. Ewing, James. Tumors of Nerve Tissue in Relation to Treatment by Radiation. *Am. J. of Roent.*, vol. VIII, No. 9, 1921.
3. Withers, Sanford. The Fundamental Principles of Radiation Therapy. *The Med. Herald and Electro-therapist*, vol. XLII, No. 9, Sept., 1923.
4. Regaud, Cl. Fondements Rationals, Indications Techniques et Resultat Genereaux de la Radiotherapie des Cancers. *J. de Radiol. et d'Electrol.*, 1920, 4, 433.
5. Broders, A. C., and MacCarty, W. C. Epithelioma. *Surg., Gyn. and Obs.* Aug., 1918.
6. Withers, Sanford. Carcinoma of the Eyelids Treated With Radium. *Am. J. of Ophth.*, vol. 4, No. 1, Jan., 1921.
7. Gilles, J. D. Plastic Surgery of the Face.
8. Duncan, Rex. Primary Epithelioma of the Cornea With Treatment. *Am. J. of Ophthalmology*, vol. 4, No. 7, July, 1921.
9. Ewing, James. A Review and Classification of Bone Sarcomas. *Arch. of Surg.*, vol. 4, No. 3, May, 1922.
10. Bowing, Harry H. The Value of Radium and X-ray Therapy in Hodgkin's Disease. *J. of Rad.*, vol. II, No. 11, Dec., 1921.
11. Soiland, Albert. Radiation in the Treatment of Leukemia. *J. of Rad.*, vol. II, No. 11, Dec., 1921.
12. Renon et Degrais. The Late Results in Cases of Myeloid Leukemia Treated by Radium. *Bulletin Acad. de Méd.* Feb., 1921.
13. Wickham and Degrais. Radiumtherapie. 1912.
14. MacKee, Geo. M. X-ray and Radium Treatment Diseases of the Skin, pp. 488-496. 1921.
15. Simpson, Frank Edward. Radium Therapy, p. 297. 1922.
16. Quick, Douglas. Radium Technic in the Treatment of Malignant Diseases of the Skin. *Arch. of Derm. and Syph.* Sept., 1921.
17. Loucks, R. E. Indications for Radium Therapy in Ophtho-Oto-Laryngology. *J. Mich. St. Med. Soc.*, vol. XXII, No. 2, Feb., 1923.
18. Johnson, Frederick M. Aberrant Adenoid Cystic Epitheliomas of the Salivary Gland Type. *Am. J. Surg.*, vol. LXXV, No. 3, March, 1922.
19. Broders, A. C. Basal Cell Epithelioma. *J. A. M. A.*, p. 850, March 22, 1919.
20. Johnston. *J. of Cutaneous Diseases*, p. 23. 1905.
21. Ewing, James. *Neoplastic Diseases*, p. 882. 1922.
22. Heyerdahl, S. A. Actinomycosis Treated With Radium. *J. A. M. A.*, vol. 73, Dec. 27, 1919.
23. New, Gordon B. Actinomycosis of the Tongue. *Am. J. of the Med. Sciences*, vol. CXLIII, No. 4, April, 1922.
24. Montgomery, Douglass W., and Culver, George D. The Action of Radium on a Variety of Cutaneous Conditions. *Arch. of Derm. and Syphil.*, vol. II, p. 500, October, 1920.
25. Mattice, A. F. *Arch. Ophth.*, vol. XLIII, p. 237. 1914.
26. Knox, Robert. *Text, Radiography and Radiotherapeutics*, vol. II. 1919.
27. Levin, Isaac. The Technique of Radium Application in Cataracts. *Am. J. of Roent.*, vol. VII, No. 2, Feb., 1920.
28. Franklin, Walter S. and Cordes, Frederick C. Radium for Cataract. *Am. J. of Oph.*, vol. 3, No. 9, Sept., 1920.
29. Franklin, Walter S., and Cordes, Frederick C. Radium Applicator for Cataracts. *Am. J. of Ophth.*, vol. 4, No. 6, June, 1920.
30. Personal Communications from C. W. Presnell, Trinidad, Colorado, and Rex Duncan, Radium and Oncologic Institute, Los Angeles.

BLINDNESS CAUSED BY INHALATION OF COAL GASES, RECOVERY.

GYULA FEJÉR, M.D.

BUDAPEST, HUNGARY.

In the case here reported, disturbance of vision was noted on regaining consciousness, but it became worse, until two days later the patient was practically blind. Recovery was almost complete. The lesions seem to have been located in or near the cortical centers.

It is not very often that we meet with cases of blindness caused by coal gas; probably because the severe cases are mostly lethal, so that there is no occasion to notice any disturbances of sight, and probably because in the lighter cases, the patients usually do not complain of similar troubles.

Illuminating gas contains coal gases (CO , CO_2 and CH_4) in a high percentage. Insufficiently burnt charcoal, badly regulated stoves produce CO , charcoal gases are used likewise to work machines. According to Jahsch, CO expels oxygen from the red blood globules and unites with hemoglobin, or oxyhemoglobin, thru which process blood ceases to transfer oxygen to other textures. The affinity of coal gases for hemoglobin is two hundred times stronger than that of oxygen. This explains the great number of deaths caused by illuminating gas (76.13%).

CASE. In my case, the patient, a stoker, aged 62 years, fell into a tank containing coal gases. He entered the tank at its lower door, in order to clean it, without noticing that its bottom was still full of coal gas. He inhaled the coal gas, fell from a height of half a meter to the bottom, where he lay unconscious for some minutes, until he was rescued and transported to a nearby hospital, where he remained for four days. Outward injuries could not be detected, neither on the head nor on the environs of the eyes. On the first day, he remained unconscious, later he regained consciousness, but complained of disturbed sight. After having left the hospital on a Saturday, he still saw enough to enable him to shave himself on Sunday; but he lost his sight on Monday and was led to me in the evening.

The head and face in the vicinity of the eyes did not show traces of injury. The movement of the eyes was

in every direction satisfactory, the pupils were equal, their reaction good in all respects, the media were clear and transparent, the papillas sound. In the eyeground a minor discoloration could be observed, but the blood vessels of the retina did not show any aberration in respect to their course and their repletion of blood.

The patient perceived movements of the hand with both his eyes, his sensibility to light and localization of light were good. As I was unable to explain the blindness, and intended a thoro examination of the case, I transferred the patient to the ophthalmologic department of the hospital. At his admission, he was able to count fingers from a distance of one and one-half meters. The objective investigations did not show any abnormalities. Urine was normal, Wassermann negative. The analysis of the blood did not show aberration; the number of the red blood globules is 6,000,000 that of the white ones 10,000. We found 82% leucocytes, 9% lymphocytes, 2% basophil cells, 3% eosinophil cells, 4% transition forms.

As already there had elapsed seven days since the intoxication took place, it was too late for a spectral examination. I prescribed potassium iodid at all events. The vision of the patient improved gradually. After a fortnight he could count fingers with the right eye from a distance of two meters, with the left eye from five meters; the field of vision was narrowed concentrically. After a week the vision of the right eye attained 5/50, that of the left 5/25, the central color perception was normal. After a few more days, the vision of both eyes rose to 5/5. At the last examination the field of vision was almost normal.

Among the similar cases recorded in the literature, we meet diminution

of the central faculty of vision in three instances, restriction of the field of vision in three instances. In all other cases, the complaints were limited to the eye muscles, to disturbances of accommodation and to enlargement or contraction of the pupil, all of which symptoms disappeared soon in each case.

Only in a single case, recorded by Purtscher, do we find total blindness, which continued for eight days and bilateral hemianopsia during some months. In the second case to be found in the literature, the disturbance of vision continued for seventeen days. As to the question of the origin of blindness, I have the opinion of Purtscher, who supposes, that a hemorrhage, or softening either of the vis-

ual radiations, or of the cortex itself, has in his cases caused bilateral blindness and hemianopsia.

The fact, that the light reaction of the pupils did not suffer, acts as further proof for the supposition, that the center of the pathologic process is to be sought in the vicinity of the cortex. In the organs of subjects killed by illuminating gas, ecchymosis, hemorrhage and centers of softening in the brain are found often. In my case, it is the only explanation for the recovery of the patient, that the hemorrhage has been absorbed, or that the disorder of circulation in the cortex, which may be considered as the initial stage of a process of softening, has come to an end.

ACCURACY OF SKIASCOPY AS BASED UPON A STUDY OF FIFTEEN THOUAND EYES.

C. A. CLAPP, M.D., F.A.C.S.

BALTIMORE, MD.

The measurements of refraction on which this paper is based were made with the electric ophthalmoscope from a working distance of one-half meter, with complete cycloplegia. The reasons for the technic used are given. The proportions of cases giving results within different limits of accuracy are given and the different sources of error and ways to escape them are discussed.

Since Jackson wrote upon "Exact Skiascopy" in 1903, I have been much interested in the question as to whether such accuracy as he mentions ($\frac{1}{8}$ to $\frac{1}{4}$ D) could be obtained. Many of my colleagues have been skeptical of such results while a few have held that it was absolutely impossible to approach anywhere near such accuracy. More recently Newcomb in A.J.O., May, 1919, claims that the objective method is more accurate than the subjective and the latter method has been discarded in the Dept. of Ophthalmology of the Attending Surgeon's Office. While this may be sufficient for the Army, I think very few of us who are enthusiastic boosters will go quite as far as Major Newcomb.

It is quite evident if one does not check up the skiascopic finding by subjective methods that his skiascopy will be 100% correct. At least he will not know that an error has been made.

After testing out nearly all of the

methods mentioned in the various text books and published articles, I have adopted the following as being most accurate in my hands and which have seemed to be the most accurate in the hands of students who have mastered the technic.

First. Use of the electric skiascope.

Second. Working at 50 cm. ($\frac{1}{2}$ M.).

Third. Skiascopy only under complete cycloplegia.

Fourth. By using skiascope lenses in a hard rubber frame as described, by Crouch and Clapp in the AMERICAN JOURNAL OF OPHTHALMOLOGY, February, 1914.

Fifth. Macular skiascopy.

A word of explanation is necessary upon each of these headings.

First as to the electric skiascope. Many of these instruments are so inaccurate that most imperfect results are obtained, and I am at a loss to know why manufacturers will allow such instru-

ments to leave their factories. The only safe method in buying such an instrument is to first test it, and determine its accuracy. I have also found that the old lamps with long horizontal filaments are more accurate than those with the vertical or pointed filaments. It is necessary to find the point of reversal of both the greater and lesser curvature, the reflection of the filament being at right angle to the curvature to be determined. To be sure the filament produces an artificial band which to the novice may be taken for an astigmatic band, but a little practice will soon overcome this illusion and the difference between the results in the lesser and greater curvatures will be the amount of astigmatism.

The great advantage of almost complete darkness is of more importance than the disadvantage of an artificial band.

Secondly—Working at $\frac{1}{2}$ M. distance has been advised by many previous writers and I wish to corroborate their advice. Some have recommended working at $\frac{1}{4}$ M., but this causes such a great error if the distance is not exact that I much prefer the $\frac{1}{2}$ M. distance. The shadow is much larger and more distinct than at greater distances and can be followed with so much greater ease and accuracy that in my experience there is but little question as to its advantage, besides which the operator can make the change of lens without altering his position.

The *third* requirement (complete cycloplegia) needs little if any elaboration. While articles have appeared (notably Sheard's (Amer. Enc. of Ophthal. P. 11793) as to skiascopy without a cycloplegic and methods described by which letters are used for the purpose of fixation, anyone having had much practice knows the almost impossibility of getting even approximate results with the ciliary muscle contracting and relaxing and the refraction constantly changing, and as to the practicability of measuring the amplitude of accommodation by this method, I much prefer subjective methods.

Fourth—While Major Newcomb says "The use of so-called skiascopic frames is not recommended as their use leads to hurried and careless methods and the determinations made are gross determin-

ations and only approximate actual correction," this may be the case in the hands of some, but after trying out trial lenses in frames, and all other methods suggested, I found that the largest percentage of accurate or nearly accurate results were obtained by the use of such lenses. While it is possible some have never become proficient in their use, the statistical study here given was obtained by the use of such frames.

Fifth—In reference to the heading of macular refraction, I wish to caution all who are striving for accuracy to disregard manufacturers and others who advise fixation at the side of the light or over the head as one finds very definite and oft times considerable variation in the findings between the macula and those readings taken near the macula. The cycloplegia should be so complete that fixation upon the mirror does not cause accommodation and while a small scotoma may result for a few minutes, I have never found it lasting.

On account of finding the point of reversal of the shadow in both the greater and lesser curvatures of the refracting elements, I have classified my results as:

(1) Those where the measurements proved to be exact in both diameters.

(2) Those which were exact in one diameter and $\frac{1}{4}$ diopter from being correct in the other diameter.

(3) Those which were $\frac{1}{4}$ diopter from correct in both diameters.

(4) Those over $\frac{1}{4}$ diopter in each diameter.

This latter group I have again subdivided to see if one could determine what was the cause of error in those that were inaccurate. Now I am well aware that if one has a skiascopic measurement upon an eye, it gives the refractionist a preconceived notion, and unless great care is exercised his subjective reading will correspond to the skiascopic; and again the ordinary dispensary practice is not conducive to an accurate study of this kind as too frequently if a vision of 20/20 or even 20/15 is obtained with the skiascopic findings, further refinements are not attempted.

In order to make this a true study it was therefore carried out upon private patients only, and in order to prevent a biased opinion the first results were

checked up by my partner, who had no interests in obtaining similar results as the skiascope.

At times a reading was taken by the ophthalmometer before skiascopy and at other times no such reading was made. As one becomes more expert with the mirror he loses some respect for the ophthalmometer. The percentages of these groups were as follows:

Exact in both diameters.....	35.92%
Exact in one and $\frac{1}{4}$ diopter error in the other.....	33.22%
One-fourth diopter error in both diameters	20.22%
Over $\frac{1}{4}$ diopter in either one or both diameters	10.64%

I think we are therefore perfectly justified in maintaining that under proper care as to details one can skiascope an eye to within $\frac{1}{4}$ diopter in 90% of the cases, and $\frac{1}{4}$ diopter is almost within the limits of error, as frequently there will be found this much of a difference between a cycloplegia examination under homatropin and one under atropin.

I have further subdivided the 10.64% which showed error of more than $\frac{1}{4}$ diopter to see if the percentage of accuracy might not be increased.

CAUSES OF ERROR.

Among conditions causing errors are scissor movement, opacities of the cornea, active accommodation, high errors, etc.

(1) Scissor movement which resulted in more than $\frac{1}{4}$ diopter error occurred in only .07% of the cases, and in all probability we shall be unable to alter this figure but little. Fortunately the condition occurs but rarely.

(2) Opacities of the cornea were responsible for 0.28%, and this again is small and will probably remain more or less permanent, and besides there are a few cases where the opacity is so large that no reflex can be made out satisfactorily.

(3) Active accommodations were responsible for 1.6% of errors. It is quite possible to place a large part of this group in the more accurate group. As a rule the skiascopic reading was first made, and if active accommodation was found, then more of the cycloplegic was instilled until accommodation was relaxed

but no further reading by the skiascope was taken. Therefore I am certain that this group can be made smaller.

Some have inquired how one determines whether there is active accommodation. There is no hard and fast rule, but if there is poor vision, say 20/30 which cannot be brought up to 20/20 or 20/15; if there is decided uncertainty as to axis of cylinder; if same uncertainty exists as to strength of cylinder or sphere, it is safe to assume activity of the ciliary muscle and further instillations should be made, after which the uncertainty usually disappears and the visual acuity becomes normal.

(4) Over five diopters of myopia.

I have considered this to be a legitimate excuse, as it is well known that $\frac{1}{4}$ diopter in the sphere or cylinder among these cases of high myopia makes very little difference with visual acuity. This percentage was only 0.7 and I am inclined to think that it will remain approximately the same. It is also quite possible that the skiascopic reading is as accurate as the subjective method, but be that as it may we have taken the subjective one as the court of the last resort. Some of these cases were between twenty and thirty diopters of myopia, therefore entitled to error.

(5) Over plus five diopters makes up a smaller group, 0.4%, and what has been said of group four may be said of this group. Possibly we may become more accurate in those up to plus six or seven, but when cases are encountered above ten and as one recently of plus fourteen and a half, a quarter is of little moment.

(6) *No Excuse*—As far as we could determine there was no condition or circumstance which prevented us from obtaining more accurate results in this group, and it is to this we should turn our chief attention in order to lessen our errors.

I am certain that some of the advocates of other methods will hold that if I had used their particular method that my percentage for accuracy would have been much better, but to these I would suggest their keeping an accurate account of their next one thousand cases and note their results. It not only may surprise them but will stimulate to more accurate attention to details.

It is also apparent that if one discarded all cases except those with perfectly clear media, the percentage of accuracy would be higher, but it seemed to me from a practical standpoint that all cases which showed a shadow that could be followed with any degree of accuracy should be included.

Some of the circumstances which help to make this inaccurate group are as follows: The physical condition of the

operator; a new lamp in the skiascope; a little difference in the current; lack of cooperation of the patient; not quite complete darkness of the room; distractions of telephone, stenographer, etc.

This group I should like to see reduced to about 2% and in this way make our errors of more than $\frac{1}{4}$ diopter in only about 5% of the cases, these having some more or less valid excuse in the greater number.

SOME AFTER RESULTS OF STRABISMUS OPERATIONS.

CLARK W. HAWLEY, M.D.

Prof. Ophthalmology Post Graduate Medical School & Hospital.

CHICAGO, ILL.

The general reason for correcting strabismus and the operation for the purpose are discussed. Illustrative cases are cited. The relation of a good cosmetic result to binocular vision and fusion is also considered.

The object of this paper is not to enter into a discussion of the operations for strabismus, but to relate some of the results accomplished, good and bad.

The objects to be obtained by correcting crossed eyes are cosmetic and developing useful vision by getting binocular vision and fusion. The first can now be always accomplished, but the latter not always, though oftener than we have been lead to believe. By the improvement in the technic the cosmetic can now be obtained in nearly all cases, and it is unnecessary for one to go about with this deformity. But to produce useful vision, that is binocular and fusion, I believe is possible from the results apparent in some of my cases, but the route is long and requires much patience on the part of both doctor and patient with the amblyoscope. In several of my cases I succeeded so well that I am sure it can be accomplished tho some good theorists claim not. The cases I shall report show relief from annoying symptoms and apparent use of both eyes.

The causes of strabismus are not well understood as yet. Theories there are a plenty, but no one has advanced a cause that will fit the majority of cases. The amblyopic eye has been advanced as a cause, and in some cases it may be an element, but if it were a prominent one there would be many more cases of strabismus as amblyopic eyes are very common. Malposition of the muscle at-

tachment has been suggested as a factor, I believe most authors have now discarded this theory. In my operative work I have failed to find a single attachment that I could say was misplaced. What I have found that I feel is an important factor as a cause is an undeveloped muscle. Some of the muscles have been mere threads of muscular tissue. The fact that the excursion of the eye outwards or inwards is so faulty shows that there is lack of power. I have been struck by the frequency of this faulty development of the muscle and when I have operated on the muscle of the opposite eye I have found a well developed muscle. I am convinced that this is a dominating cause in many cases.

Faulty convergence and paresis can be eliminated for the same reason as the amblyopic eye. We would have many more cases of strabismus if these were important factors.

Probably no one cause contributes to the cause of the deformity, but all may have some effect on the production of the strabismus.

We must take into consideration the central origin of some of the cases illustrated in alternating cases, which also must have some relation to the ordinary cases.

In my early work of thirty years ago tenotomies were the main reliance to correct the deformity, and sometimes we tried to correct by severing the attach-

ment and advancing it to the edge of the cornea, but this only made an attachment at the same old point on the sclera and the results were very disappointing indeed in my hands, at least as the rotation of the eye from the supposed attachment at the corneal edge was not realized. In making this supposed insertion the operator thought he was advancing to the edge of the cornea as a new point of control of the motions of the eye, but in this he was disappointed, as the attachment was at the old point which has often been proven by secondary operations on the muscle. All of the muscle in front of the old point disappeared, and we had the point of control at the old point on the sclera.

By these operations the patient was disappointed and the doctor was not proud of the result.

The improvement of the operation by tucking the body of the muscle resulted in much better cosmetic appearance, but it had its faults. Then Worth of Scotland tucked the muscle from the outside, attaching the body of the muscle to the tendon attachment, not a very good surgical technic. Dr. Harry Woodruff of Joliet improved on this by doing it beneath the conjunctiva with much better results still, bringing the body of the muscle and as much of the subconjunctival tissue up to the tendon.

This operation in my hands has produced very fine results, cosmetically and with some vast improvement in the muscular balance.

Briefly the operation consists in dissecting back the conjunctiva, conserving the subconjunctival tissue as much as possible, to the canthus, then passing a catgut suture around the third of the muscle above and below, then advancing the body of the muscle to the tendon attachment stitching it to the tendon, where it becomes attached, then replacing the conjunctiva. The resulting bunch soon disappears, and the result is all one can ask for, if one's judgment has been good. Usually both eyes have to be operated on as we cannot take up too much muscle as it would restrict the movement of the eye. I have performed this operation for a number of years and it has never disappointed me.

What are the ends to be obtained by

this operation? First consideration is for the cosmetic effect, and rightly first, because the patient will be rid of the unsightly appearance, especially in men for it is a great handicap in seeking employment, and militates against advancement when employed. Many employers will not take on one who has this deformity, and with this method the patient is sure of good results when done by a competent operator. The next result to be obtained is binocular vision and fusion. Can this be done? Some claim this can be done only in very young children, and others that it cannot be accomplished at all. I differ with the latter, as I have a number of cases in which I have been able to get binocular and fusion vision in grown people. But it takes much time and patience on both the patients' and the doctor's part. Very few oculists will spend the time that is necessary, and most patients get tired of practicing with the amblyoscope. Some claim that we cannot educate the brain centers. Why not? The original function of the centers was toward binocular vision and fusion, so it seems to me that we should be able to bring them back to their original function. We educate the brain center to control other functions as they should, why not here?

Here are some of the examples where I am sure I got both binocular and fusion vision.

Twenty years ago a lady came to me with a divergence of the left eye, with fair visual acuity in it, expecting me to cure the defect with glasses, but when I told her it could be done only by an operation she would not consent. But some time later she came up from the country and said I might operate, and that she might not have time to change her mind, I immediately put her on the operating chair and did a tenotomy. As the divergence was not great, the result was perfect position. Trying at once with the red light I was surprised to discover that she had binocular vision.

She was fairly faithful to the practice with the amblyoscope and was progressing toward fusion when she married and moved to Oklahoma. So I am not certain of the final result, but I am sure she would have developed fusion had she continued practice. What

changed her mind about the operation was amusing. A friend had been to a quack near my office and he had operated with fair result. He tied the patient to the table and proceeded to operate when the patient objected because he began to cut the eye. She reminded him that he advertised to straighten cross eyes without the use of the knife. He replied, "we use the scissors." He did the operation without cocaine. My patient thought if her friend could stand it she could.



Fig. 1. Case of divergent squint before operation.

When I had done the tenotomy she said "you are not thru are you?" expecting pain. This was my first case in attempting to get fusion and I am sure we would have succeeded had she remained. But one fusion occurred, she got a husband and moved away.

Another interesting case showing a good after result is that of a woman of about forty years of age, who had all her life suffered with a vertical strabismus, resulting in a life time of severe headaches.

She tried to obtain relief thru glasses but to no purpose, and she came to me frequently and I finally had to tell her the only relief was thru an operation. To this she would not consent as she had promised her mother she would let no one operate on the eye when a young girl. One day she appeared in the office when a young woman came in

on whom I had done the same operation. After seeing her she consented so I did a tenotomy at once. When I picked up the muscle she said "there is where my headaches come from" and kept repeating until I had severed the tendon when she at once remarked "there, they are gone," getting relief at once and having none since. This shows how foolish some patients can be about operations. No attempt was made at binocular vision as the eye was almost sightless.

Another singular result from a tenot-



Fig. 2. The same case showing result of operation.

omy was on a sixteen year old girl. I operated for a convergent strabismus with good cosmetic result. No attempt was made toward visual improvement, why I do not remember, but the mother reported later that I had relieved the young lady of epileptic fits, as she had none since the operation.

About this time I did my first operation by the Woodruff method for a convergent strabismus, with charming result so far as looks were concerned. The right eye being very amblyopic, glasses were fitted and the eye remained straight. While preparing this paper the lad came in to be refitted for glasses, and on removing them I found that the right eye turned in considerably. He said that it remained straight for a number of years but of late when he removed the glasses the eye converged, but on replacing them it assumed the straight position. This

result shows that the correction of nearly blind eyes are affected by proper refractive results. In this case it could only be done by a careful retinoscopy.

I am brave enough to admit some failures. Here is a lad on whom I did a tenotomy when small with a resulting divergence in later life. I now want to correct my error but he has not worked his courage up to the operating point, but I hope he will.

Since adopting the Woodruff operation I have had only one failure to accomplish permanent cosmetic results, and that was in the lad spoken of above, but it enabled glasses to keep the eye in position.

The most perfect result so far as cosmetic and binocular vision and fusion are concerned is the following:

A school teacher from Wisconsin was sent to me for glasses to relieve such severe headaches that she was compelled to leave off teaching. I found a divergent strabismus of considerable degree, and I told her an operation was the only recourse and she consented.

I did a Woodruff advancement on both internal recti and with perfect result so far as cosmetic effect. Later testing the muscular balance I find it almost perfect, a result not often obtained. I put her to using the amblyoscope and she was very faithful and reports that so far as she can tell she uses both eyes. I examined them lately and she still retains perfect binocular vision and fusion.

Woodruff calls the operation a muscular shortening. I think it both a shortening and an advancement as we bring the body of the muscle up to the tendon attachment, thus advancing that portion of the muscle.

One of my recent cases so far as looks goes in perfect, and he showed binocular vision at once. While practicing with the amblyoscope in my office, the bird would approach the cage and when almost to it would jump to the other side of the cage; just once he said, there he goes into it, but it did not remain. I gave him the instrument to use at home but the mother brought it back and said she could not get him to keep up the practice.

I am sure this case would have de-

veloped fusion could we have continued, as he has almost perfect orthophoria, a small hyperphoria being present but causing no disturbance.

Another very good after result in children is an improvement in their mentality. I remember a clinical case of a very timid child, where the other children annoyed her so much that she was very backward in school. After the operation the nurse reported her as doing splendid work and that she was much less timid and quite happy.



Fig. 3. Cosmetic result of operation for convergent strabismus.

I have been encouraged to write this paper hoping that others might have the operation. But the ethics of the profession do not allow us to get the results before the ones needing the operation. The quack uses the daily papers and straightens them "without the use of the knife." The oculist must work thru the advertising he can get thru the general practitioner. And he cannot present the subject to his patients in the proper light. He recommends the patient to the oculist but few of them turn up in our offices because they dread an operation.

In conclusion we can, by the improved technic, get perfect cosmetic results, binocular vision is obtainable and I am sure we can obtain fusion, but it is a long route and takes much time and patience on the patients' part.

NOTES, CASES, INSTRUMENTS

ASTIGMATISM IN HIGH MYOPIA AND A NEW WAY OF TESTING IT.

E. H. OPPENHEIMER, M.D.

NEW YORK CITY.

Myopes of high degree frequently hesitate to wear distance glasses, arguing that they can manage to get along without any and that their glasses are inconvenient, heavy and unsightly, besides making things look unnaturally small. The older the patient is, when he begins to wear glasses, and the less educated a class he belongs to, the more chance there is, especially with women, that glasses will even be discarded. On the other hand, it used to surprise me that so many myopic patients consulted me for the special purpose of obtaining glasses for close work only.

Unfortunately, fundus changes often reduce vision of myopes. If the amblyopia is considerable, even most careful correction may scarcely affect the result and be worth the time spent. In some cases, however, part of the apparent amblyopia may be due to lack of correction. Some myopes have no fundus changes apparently and amblyopia in spite of this, while others have perfect or nearly perfect visual acuity. Of course, in all cases we try to give the best glasses we can, correcting all astigmatism. But in quite a number of cases it seemed to be impossible to get much benefit from cylinders, altho the cornea of a myope is surely just as likely to be astigmatic as any other one. This reasoning induced me to test high myopes, and sometimes medium ones, in a different manner, so far as I know, than that used in Europe, where I have hitherto practiced.

The customary routine examination is as follows: Refraction is determined objectively, then vision and glasses for distance are tested subjectively. As already mentioned, I find that for various reasons cylinders often fail to improve sight, as much as one might suppose. In the testing the eyes tire; and even intelligent persons are apt to be unable to decide which glass is to be given the preference.

The significance and value of an astigmatic correction, however, lies in the fact that, even if it affords slight or no advantage for the distance, it means everything for close work. Often it is just that which drives the patient to the doctor, and so we ought to try our utmost to get a perfect astigmatic correction.

The principle of my test is this: I let the patient look at his *far point* while testing, thereby not straining his eye and altering optical relations by placing a cylinder on top of his already thick spherical correction. Thus a number of errors and disadvantages are avoided, and it is obvious that more accurate results are obtainable. Not the least advantage gained is, that this manner of testing readily convinces the patient that he is actually getting glasses for close work and real help.

Without insisting that this is the only way of working on this principle, I shall describe my method: After examining in the routine manner, I control the far point of each eye and try to determine presence and axis of astigmatism by means of the chart. I then place the card at the far point (or a trifle closer), using print adapted to the degree of probable amblyopia. Weak cylinders, preferably convex, are put into the customary trial frame. The patient rotates them himself until the letters or chart lines appear or become clearer. Concave cylinders can also be tried—this amounts to the same thing, only proving that the test had been made too close or too far.

Sometimes, in extreme myopia, a weak concave lens will be necessary to push the far point away.

After having tried the method, I looked up the literature and discovered that twenty-five years ago Hegg (Klin. M. f. Augenh., 1898) devised an apparatus to determine simple myopia, a tube with a cotton thread at the far point. Hegg concludes: "Perhaps subjective astigmatism can also be determined by this instrument." In what manner, he left to the imagination of the reader. His instrument

surely never has been used much, or else I would have come across it. Some of my teachers occasionally measured the far point in a primitive manner; but then retinoscopy was not practiced.

I use a contrivance which, for the sake of a name, I call myop-astigmometer. It is a ruler with scale and handle on which a card with print and astigmatic chart slide. Gall and Lembke, opticians, 6 East 48th St., New York, make it. One of the astigmatic charts of Friedenwald, printed on page 10 or 11 of this JOURNAL, can easily be substituted, if desirable.

REMOVAL OF FOREIGN BODY FROM LENS WITHOUT PERMANENT OPACITY.

T. HERBERT BELL, M.D.

WINNIPEG, CANADA.

CASE. A. W. M., aged 28, scale adjuster, consulted me, Nov. 10, 1923, for a foreign body on the right cornea. There was a large foreign body on the cornea, below the pupillary margin, at 8 o'clock. While removing this, I was struck by a peculiar appearance in the lens, just above and inside the center, which I identified as a foreign body, well behind the plane of the iris, and within the pupillary area, so that the capsular wound was not covered by the iris. The anterior chamber was full, with no iris prolapse; and the pupil active, no congestion or adhesion. He was admitted to the hospital, and by means of the giant magnet, I drew the foreign body against the back of the cornea, led it into the iridic angle, and removed it thru a small incision in the cornea, losing very little aqueous. It was a very small particle of metal, about 1/2 mm. in diameter. The patient was put to bed, and on opening the eye next day, I was surprised to find no clouding of the lens. He had no discomfort, nor was there the least congestion, and he was discharged from the hospital Nov. 14.

Nov. 15: Seen at my office. Under atropin: V. R.=6/10, L.=6/6. Only

a very small opacity in the lens, showing the site of the foreign body.

Nov. 26: R.V.=6/6 pt. Pupil recovered from the atropin, no extension of the lens opacity.

Dec. 3: R. V.=6/6. No extension of opacity.

Dec. 22: R.V.=6/6. No change.

March 18, 1924. R.V.=6/5 pt. There is a small circumscribed opacity in the lens, at the site of the foreign body and no sign of diffusion of the cataract. The rest of the lens is absolutely clear.

COMMENT. In the literature at my disposal, I cannot find record of a similar case, where the foreign body had passed thru the anterior capsule on two occasions, and left such a small opacity behind, and did not produce a complete traumatic cataract.

Parsons' Pathology, p. 1172, says: "If the capsule wound is very small, especially if protected by the iris, complete opacification of the lens may be delayed, but is almost invariable. Rare cases are reported in which the cataract is limited to the track of the foreign body, or even clears up to some extent."

Ramsay, "Eye Injuries and their Treatment," 1907, reports a case of a piece of steel in the lens, in which there was no opacity. He feared removal would cause a traumatic cataract, and the foreign body was allowed to remain, causing no symptoms for eleven months, when there developed an intense iridocyclitis, and the lens became cataractous from inflammation and siderosis, and was removed, leaving some vision.

Duane, in Fuchs, sixth edition, p. 549: "In traumatic cataract, it is the rule that the opacity of the lens becomes total, spreading rapidly from the site of the wound in the capsule, to the rest of the lens. Exceptionally, however, cases are observed, in which the opacity of the lens remains partial, or indeed actually disappears. For this to occur, the capsule wound must be very small, so that it closes quickly and the aqueous no longer has access to the lens fibers. Most favorably situated in this regard are those

capsular wounds that lie behind the iris, by the adhesion of which to the wound, the latter is very soon closed up. In such cases it may happen, that a circumscribed opacity remains confined to the site of the injury, or if the foreign body has penetrated the lens, is found along the track of the wound. By resorption of the opaque portions, the opacity itself may even in part clear up again."

Dixon, in the *AMERICAN JOURNAL OF OPHTHALMOLOGY*, March 1924, reports a boy in whom a foreign body was discovered in the lens during a refraction, which had not given rise to a diffuse cataract.

STEEL IMBEDDED IN EYE SIX YEARS WITHOUT SYMPTOMS.

JAMES A. MORGAN, M.D.

HONOLULU, T. H.

Six years following the accident that caused the steel to pierce the left eye, the patient was awakened in the early morning by a sharp, pricking pain in the same eye. The eye was markedly injected and sensitive to the light. Examination revealed a black foreign body, the size and shape of half a pen point, projecting thru the iris into the left lower quadrant of the anterior chamber. The cornea was slightly opaque in the same quadrant.

A magnet drew the foreign body into the anterior chamber, from where it was removed by incision and forceps. The eye returned to normal.

The point of interest in this case is the long balance between the traumatizing effect of the steel and the resistance of the tissues involved.

UNILATERAL NEURORETINITIS WITH RAPID RECOVERY.

JAMES W. SMITH, M.D.

NEW YORK, N. Y.

(Case presented at the Section on Ophthalmology of the New York Academy of Medicine, January 21, 1924.)

L. B., female, negress, age 20, appeared at the eye clinic of the New York Post

Graduate Hospital, on December 4th, 1923, complaining of blindness in the left eye during the previous two weeks. Her vision had been failing during the last six weeks. No other symptoms present. The family history was negative; seven sisters and four brothers alive and well. Previous personal history negative.

V.R. 20/20. External and fundus examination negative.

L.V. Fingers at 2 feet. External examination negative. Fundus: Intense inflammatory papillitis, with swelling of one diopter. Midway between the disc and the macula, and slightly below, about twenty white spots, (retinal), were seen; some discrete and others conglomerated. About the macula was an incomplete star figure. Ophthalmoscopically the lesion resembled that of albuminuric neuroretinitis.

Tests showed the blood Wassermann, urine, teeth, nose, accessory sinuses and head to be negative. No examination of the blood chemistry or spinal fluid could be made, on account of the patient's irregularity at the clinic.

December 13, 1923. The second examination revealed marked progress of the fundus findings. Disc swelling now measures $2\frac{1}{2}$ diopters, further circumpapillary exudation, new formed vessels superiorly, marked retinal edema, periarteritis and folds in the retina above the nervehead. White spots previously noted unchanged but a complete star figure is now present at the macula. The intensity of the papillary changes suggested the possibility of local nerve pathology. Gumma of the optic nerve was suggested as a speculative diagnosis.

December 20. Potassium iodid, gr. xv, t.i.d. p.o. and inunctions of mercury on retiring, were ordered.

1924, Jan. 3. During my absence from the clinic, an assistant discontinued this medication and substituted mixed treatment.

January 17. The patient failed to report for further examination and returned to the clinic in response to my letter.

V.R.=20/20; V.L.=20/40.

The entire fundus showed a surprising improvement. The nervehead is very hyperemic with the edges slightly blurred. No elevation or circum-papillary exudation. The white spots temporarily are seen as early choroidal atrophy. Most of the retinal exudates have undergone resorption and only a few striations are now present at the site of the star figure.

March 13, 1924. Vision L. 20/25. The only pathology still evident ophthalmoscopically is the mild hyperemia of the disc and the white atrophic spots in the choroid. No evidence of star figure, striations or exudation, about the nervehead.

COMMENT. This patient is presented because of the infrequent occurrence of unilateral papillitis with star figure at the macula, without demonstrable pathology. Unfortunately examination of the spinal fluid could not be made. Of particular clinical interest is the astonishing restoration of vision from perception of fingers at two feet to 20/40—following such small quantities of potassium iodid and mercury. Assuming the patient to be syphilitic, it is difficult to explain this marked visual improvement on the basis of haphazard medication. One cannot but incline to the belief that the etiologic factor in this case was not discovered, owing to the incompleteness of the laboratory tests, and that recovery might have occurred without medication.

FORMS AND PROGNOSIS OF GLAUCOMA.

G. HERBERT BURNHAM, M.D., Tor.;
F.R.C.S., Ed.

TORONTO, CANADA.

Primary glaucoma might justly be termed cyclitis; for it is a disease of the ciliary region; and the varieties of glaucoma are the consequences of the varying pathologic conditions of this region.

The divisions which seem, from my point of view, practical and somewhere nearly pathologically correct are: 1st. The acute form of different degrees of severity and *no cupping* of the

optic disc, painful and sometimes the pain is agonizing. 2nd. A form without pain but sometimes an uneasiness approaching pain, and *no cupping* of the optic disc. 3rd. A form without pain but an uneasiness and *cupping* of the optic disc, shallow at the beginning but becoming deeper in the later stages. Neither of these two latter have any pain, unless the acute form be grafted upon it, which may and does occur in the second form, but one may say never in the case of the third form.

The form with cupping of the optic disc is the only one that need give any true anxiety. The prognosis in each of the others, that is in the first and second divisions, is so favorable, that with proper treatment in any case not too long neglected, the outlook is always good.

An iridectomy in cases of glaucoma of the first and second varieties, sometimes is not successful, because the operation alone could not heal the cyclitis, but requires the addition of the medical treatment which I have advised in previous articles. This treatment is the internal administration of mercury and the iodid and bromid of soda thrice daily. If this course be used, then these failures will seldom occur, is my experience.

The anxiety regarding the variety with cupping of the optic disc in certain stages is always great and is justifiable, for the termination is blindness, sooner or later, in spite of procuring permanent normal tension by means of an operation. According to my belief this form of glaucoma baffles all our endeavors. It is doubtful if treatment of this affection thereby meaning the union of the combined treatment and the operative treatment in the same case, or the operative treatment alone has any curative effect. If it has any effect it is only to delay the dreaded outcome, not to prevent it.

Neither the first nor the second forms appears to pass into the third form. The third variety, that is with cupping of the optic disc, is to me a much more dreaded disease than sympathetic ophthalmia in any of its various modifications, that is from the mildest to the most severe, for as to the latter sympathetic ophthalmia, the "combined treat-

ment" controls and can cure as verified by narrated cases of mine; whereas, as to the former, that is the division with cupping of the optic disc, no combination of treatment, that I have tried or known of, is able successfully to grapple with this disease.

The third form of glaucoma begins, I believe, in the optic nerve, and the pathologic changes very gradually work forwards and very slowly implicate the ciliary processes. This idea would tend to explain why the second eye is always sooner or later, attacked, and certain other seeming irregularities. In this way the diseased condition of the sclera, in its various intensities, remarked upon in preceding articles, can be more or less satisfactorily accounted for. Hence later in the disease this reasoning seems to throw light upon and offer an explanation of the futility of operations and the noneffect of internal medical treatment.

These remarks apply only to the later stages of this form of the disease. The dissimilarity of the action of the pupils in cases in which one eye alone is affected, and the vision 6/15+, with the nasal field lost and a certain condition of the optic disc, all these taken into consideration have gradually forced upon me this solution, that this form of glaucoma originates in the optic nerve. In these cases the cupping of the optic disc is not very marked and is shelving towards the outer edge, and the color is good. Hence the condition of the optic disc has to be well weighed in giving a prognosis; for it is more important than the vision.

I have now one case in this stage, in which from the symptoms given to me by the patient, the earliest signs of the disease showed themselves four years ago in the left eye. The right eye is now unaffected and the optic disc is normal. For this very patient eight

years ago I prescribed glasses and then made the note, that the optic discs are normal.

However, if the disease be seen in the beginning and not later than the stage just mentioned above, then treatment medical and surgical, or medical alone, gives a good hope not only of permanently staying the progress of this form of glaucoma, but also of restoration of the nerve function, as evidenced in a restored nasal field. However, it may be that each of these two modes of treatment has a special condition of the disease, which it selects the more forcibly to act upon; but to me it does appear that the medical treatment alone has the wider scope of selection and action. Later on I expect to give cases substantiating this opinion. But I beg to repeat that where the cupping is well marked thruout and pale, tho the vision is 6/12+, the prognosis is unfavorable, and in spite of the use of every kind of treatment, blindness more or less complete is the result with few exceptions.

The other two forms of glaucoma begin, I believe, in the ciliary region and the optic disc is not affected till later, and then an atrophy without cupping. Therefore I am of the opinion that the cupping of the optic disc is primarily due to *pathologic changes* in the optic nerve and not to *pressure*. If pressure should be insisted upon as a factor then it is a very secondary one indeed.

In the other varieties of glaucoma pressure fails to cause cupping of the optic nerve.

Subsequently I hope to be able to give a few observations upon means whereby we shall be in a position successfully to use preventative measures in cases of hereditary tendency in families to glaucoma, these measures being nonoperative as a rule.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor, as read before the Society.

ROYAL SOCIETY OF MEDICINE, LONDON.

Section of Ophthalmology.

March 14th, 1924.

Mr. A.L. WHITEHEAD, Leeds, President.

Cerebromacular Degeneration.

Mr. LESLIE PATON showed four cases of cerebromacular degeneration, three of them belonging to one family. The youngest boy was now aged 8, the oldest 11. All the cases commenced to show the condition at the period of the second dentition. Having two of the cases under care, the third was carefully watched; and now there were to be seen the first changes, evident in the macula, in this disease. The girl showed the second stage of the disease, and the elder boy the third stage. The fourth stage was seen in pathologic specimen.

The youngest boy now had fits, in which he became spastic, but there was as yet no permanent spasticity. Nine months ago the elder boy was more spastic than now. He thought these cases should be classed with the cases of Tay-Sachs *amaurotic family idiocy*. Recently he saw two cases which began at about puberty, with the macular changes progressing almost to blindness, but with very little in the way of mental symptoms, except a distinct irritability of temper. Recently there had been in the hospital a case of the Tay-Sachs type, of Gentile parentage. In many cases the cerebellar changes were very marked. The chief changes in the central nervous system seemed to be a lipoid infiltration of the tissues, mainly in the vegetative portion, as distinct from the neurofibrillar portion.

Discussion. DR. GORDON HOLMES demonstrated by means of the epidiascope, the minute changes in the cerebral components. These included a swelling of the dendrites, very much like that seen in *amaurotic family idiocy*. The cerebellum showed an enormous interstitial

change. Also there was considerable proliferation of neuroglia.

Retina in Lukemia.

Mr. PATON next showed a case of splenomedullary leucemia to demonstrate the retinal appearances. At first there was a little patch of reddening, with edema and some stippling, and later that was replaced by an atrophic white area containing pigment, and a bright red patch in the center of it. Since then there had been a great distension of veins. The visual field showed very little change.

Voluntary Nystagmus.

Mr. PATON also showed a case of voluntary nystagmus. The man could do it best in bright daylight; it produced in him slight giddiness. Vision (with correction) was 6/6, and he had $\frac{1}{2}$ D. astigmatism.

Paresis of Lateral Adduction of Interni.

Dr. GORDON HOLMES exhibited a patient with paresis of lateral adduction of internal recti, with intact convergence. Evidently the man had a bilateral lesion, involving the tracts from the pons, on both sides of the middle line. The history suggested a vascular lesion. After a Sunday afternoon nap he woke up to find he was seeing double. His blood pressure was somewhat high, and his palpable arteries were thickened.

Optic Atrophy with Osteitis Deformans.

Dr. WYLIE showed two cases of osteitis deformans, with radiographic evidence of the disease in an advanced form. Optic atrophy had occurred, probably by pressure at the foramina at the base of the skull affecting the nerve. Wassermann was negative in both, and there was nothing to suggest syphilis.

Mr. PATON narrated details of a similar case of his own.

Orbital Tumor.

Miss IDA MANN showed an infant with orbital tumor. The mother was

healthy, delivery was normal, and at birth the child was healthy. At 5 weeks the eye was seen to be somewhat displaced upwards and inwards, and the upper lid could not be completely raised. A week later, nodules appeared in the skin over the body, and now numbered 23. A skiagram showed that the left orbit was enlarged, and part of the malar bone was destroyed. There was little help to be gained from the blood count. Sections of two of the skin growths showed only fibrous tissue and some thickening of epidermis. There was nothing in the case to support the idea of chloroma. Possibly both orbital and skin tumors might be secondary to adrenal sarcoma.

Discussion. DR. D. L. DAVIES (Cardiff) referred to a similar case at the other extreme of life, in a woman aged 76, who said that 40 years previously she had been treated for malignant disease of the tongue. There were many skin nodules, and after death the nodules were found to be endotheliomata, and peritoneum and liver were studded with them.

THE PRESIDENT recommended treatment by deep X-rays.

Gumma of Choroid.

DR. CARMICHAEL exhibited a case of what had been gumma of choroid. There was a distinct swelling in the region of the macula, of yellow color, and raised 4 D. Since active antisyphilitic treatment was carried out the condition had completely cleared up, leaving no result, not even a scar.

Retroorbital Tumor.

MR. HOWELL CRITCHLEY showed a girl with a retroorbital tumor. There was a five weeks' history of exophthalmos of the right eye, and headache and vomiting for 4 or 5 days. The right eye was proptosed, but there was no loss of upward movement in it. There was very intense papilledema, 5 D. of swelling. Skull skiagraphy and Wassermann were negative, and the blood count excluded chloroma.

Discussion. MR. TREACHER COLLINS pointed out that there was marked hypermetropia in the eye, in addition to the papilledema, indicating much pressure on

the posterior surface of the globe, flattening it from before backwards. He considered there was a growth in the cone of muscles behind the globe; the possibility of it being a tumor of the optic nerve was very strong, and he advised exploratory operation, via the outer canthus and external rectus.

Pemphigus of Conjunctiva.

MR. F. JULER showed a case of essential shrinking of the conjunctiva, an extreme case of pemphigus of the conjunctiva. The patient had been blind five years, and trouble in the eye began two years before that. During nine years she had been having blisters in the mouth the size of a pea, and they burst and caused much pain.

Other cases, mostly of neurologic interest, were also shown by various members of the staff.

H. DICKINSON.

COLORADO OPHTHALMOLOGICAL SOCIETY.

February 16, 1924.

DR. W. M. BANE, Presiding.

Extraction of Steel with Giant Magnet.

W. F. MATSON, Denver, exhibited a large piece of steel which had been removed that afternoon from the eye of a boilermaker. He had been pounding the edge of a boiler. The foreign body had penetrated the margin of the lower eyelid and passed thru the sclera, two millimeters below the corneal margin. Pain had been elicited upon approaching the eye to the giant magnet, and upon enlarging the incision upward and applying the magnet a piece of steel measuring four by two millimeters had been promptly withdrawn.

Discussion. C. E. WALKER, Denver. The injury was directly thru the ciliary body, and the prognosis is bad as regards sympathetic ophthalmia.

W. H. CRISP, Denver. There is a possibility in such a case that the future of the eye may be endangered by the diagnostic use of the giant magnet, and by extracting such a rather large piece of steel with the giant magnet without waiting for X-ray localization. I believe that the traumatism to the eye might have

been less if the foreign body had been withdrawn thru a posterior incision.

J. A. PATTERSON, Colorado Springs, concurred as to the risk of damage by diagnostic use of the giant magnet.

MELVILLE BLACK, Denver, thought it desirable to get the foreign body out of the way at once, on account of risk of infection.

DR. PATTERSON thought it doubtful whether these foreign bodies themselves carried infection, altho they might be the agents for the entry of infection into the eye.

W. C. FINNOFF, Denver. This is an ideal case in which to use protein therapy if we may believe the favorable reports in the literature.

G. L. STRADER, Cheyenne, Wyoming, spoke favorably of the use of salicylat of sodium by intravenous injection in this case, which he had understood Dr. Black to suggest.

DR. MATSON (closing). Some time ago we took an immediate X-ray view of such a case as this and it showed nothing. But on trying the giant magnet a distinct pull was obtained, and the foreign body was later extracted thru the posterior route.

Nevus at Margin of Optic Disc.

G. L. STRADER presented a woman aged thirty-two years in whom an extremely unusual condition had been found at the lower outer margin of the left optic disc. There was a subhyaloid mass, between one and two disc diameters across, and elevated about two diopters. From the background of the mass protruded more or less spherical patches, the larger of which were below and the smaller above. The larger spheroidal protrusions were of a bluish-black color suggesting a combination of the color of venous blood with dark pigment, whereas the smaller protrusions in the upper part of the general mass had definitely the color of venous blood, without pigment. The history was negative with the exception of an attack of jaundice a year previously. The uncorrected vision of this eye was 20/30, that of the right eye 20/20.

Discussion. MELVILLE BLACK. This is an extraordinarily rare appearance. The mass is probably congenital angio-

matosis. I have never seen anything like it. One could be more certain after prolonged observation. The highest elevated point in this mass is almost three diopters high, and two others are almost as prominent. These three points are almost black.

EDWARD JACKSON. I have never seen anything just like this case. My impression was that the blood which gave color to the masses was inside a kind of wall which gave a bluish color. I have never seen a melanotic sarcoma, even if very dark, that presented such globular projections as we have here. Another possibility is that it is an angiomatosis of the retina. The patient's symptoms did not seem to belong to this growth at all, but were rather those of failure of accommodation.

W. C. FINNOFF thought this was an angioma of some kind. He had seemed to find a retinal vessel which disappeared under the mass and did not reappear on the other side.

J. A. PATTERSON. I have never seen anything like it. The only other question I have is whether a tuberculous lesion could give any such appearance.

W. H. CRISP suggested that there was pigment in some of the globules and none in others, and that the whole mass was a sort of mulberry nevus, pigmented in varying degree.

W. M. BANE, Denver. If these masses were not so dark they might almost be colloidal.

DR. FINNOFF thought that the difference between the different globules might be due to the presence of tissue in front of the darker masses.

J. M. LAMME, Walsenburg, suggested that a good sized blood vessel would be required to supply this mass; and that hence its origin might be in the choroid, rather than in the retinal vessels.

Conical Cornea.

G. L. STRADER, presented a man who had a high conical cornea, especially in the right eye, in which the most prominent part of the cornea, distinctly below center, gave the impression of a globule embedded in the corneal tissue. The patient, twenty-seven years of age, had worn glasses off and on for three or four years. The vision was said to be

failing. With -10 . sphere -2 . cylinder axis 75 degrees, the vision of the right eye was $20/70$, and with $+1$. sphere -2.50 cylinder axis 105 degrees the vision of the left eye was $20/40$. But there was the usual variability under different conditions. The patient was engaged in desk work, but would be urged to change to an outdoor occupation.

Conical Cornea.

F. E. McKEOWN, Denver, presented a man, aged thirty-six years, whose vision had been poor for a number of years, and who showed a typical conical cornea of rather marked degree in each eye. The vision was R. $16/200$, L. $6/200$, unimproved by lenses. On examining the eyes with the ophthalmoscope one got the impression of a shifting opacity in the pupil. The patient was disposed to date the failure of vision of his left eye from an injury by a splinter several years previously.

Discussion. EDWARD JACKSON, Denver. If possible, the employers or friends of Dr. Strader's patient should try to get him suitable work, since the conical cornea is likely to increase steadily if he persists in close work.

MELVILLE BLACK. This man must stop his close work if he wishes to keep vision enough to support his family in a few years' time. Eserin or pilocarpin might be tried with advantage.

W. H. CRISP suggested that these patients should be refracted under pilocarpin, and then kept under pilocarpin.

J. A. McCaw, Denver, emphasized the variability of the refraction in these cases under different light conditions.

E. R. NEEPER, Colorado Springs. The general pathology back of this condition is not to be ignored. Many of these cases from the dietary standpoint are not normal.

EDWARD JACKSON again referred to a case which he had mentioned several meetings back, that of a man who for many years had been a teacher, and who had shown decided improvement in the last two years, both as regards the appearance of the eyes and as to freedom from complications, the improvement having followed a series of operations on the thyroid.

Neuroretinitis.

W. T. BRINTON, Denver, (by invitation) presented a man who had come on account of gradually increasing disturbance of vision of the right eye. There were no other symptoms. There was a mass of exudate in the posterior vitreous, and the optic disc was completely blurred, the vessels being covered well beyond the disc margin. The retina was very pale, and there had been some slight hemorrhages around the disc. The patient did not see anything much beyond the median line on the temporal side and above. About two days ago, light radiating spots had appeared in the macular region for the first time. Various examinations were negative, with the exception of hyalin and granular casts in the urine, and a pus cavity on one tooth. This pus cavity had been opened and drained.

Discussion. E. R. NEEPER. This man told me that he still had an impacted wisdom tooth. In the case which I brought up last month, and in which we found no other underlying condition except an impacted wisdom tooth, the tooth was removed, and in spite of a negative X-ray finding there was an extensive abscess which drained for a number of days. The one eye is lost, but I hope we are going to get a better condition in the other eye. This is a very exaggerated picture of neuroretinitis. We may expect to find the blood pressure high. It is rare for one eye to be so far advanced with the other exempt, and this is in favor of a focal infection rather than the kidney.

EDWARD JACKSON. The appearance of the fundus made me think of the possibility of a thrombus involving a single retinal vein, after influenza. Such a lesion would have to be in the vessels supplying the head of the nerve; and here the retinal vessels are not much choked. I also wondered whether such a condition might arise as a sequel to Vincent's angina. The white radiating figure in the macula has occurred in other conditions besides nephritis.

E. E. McKEOWN. I have seen this patient with Dr. Brinton a number of times. On account of the urgency of the case we gave the man a dose of salvar-

san. That night he had a violent reaction in the eye, and after that his vision began to improve.

DR. BRINTON (closing). The reaction following salvarsan was in the form of a number of small hemorrhages, particularly in the region of the disc. Altho the vision improved after that, there is not useful vision at the present time.

Glaucoma; Several Operations.

F. R. SPENCER, Boulder, presented a woman, aged eighty-one years, who had almost entirely lost her vision from glaucoma in each eye. In the right eye, which had no light projection and only faulty light perception, there had been an iridectomy and probably an Elliot's trephining or two. On the left eye, which had vision of 1/60, somewhat similar operative work had been done by another surgeon. The tension of the right eye was slightly plus. Could anything further be done with advantage? The pupils were adherent.

Discussion. MELVILLE BLACK. My impression was that these old iridectomies had been done for iritis rather than for glaucoma. I fancy the outlook is rather hopeful for the retention of what vision the patient has in the left eye. If the left eye becomes blind removal of the lens might help.

Dislocated Lens. Degenerative Changes of the Eye in Diabetes.

D. H. O'ROURKE, Denver (by invitation) presented a man, aged sixty years, nearsighted all his life, but had never worn correcting lenses. He had been under treatment for diabetes for eighteen months. The vision of the right eye was 0.04, that of the left eye shadows. There were marked degenerative changes of myopia in each eye, the right showing a posterior staphyloma. In the left eye the iris was tremulous, and a cataractous lens lay at the bottom of the anterior portion of the vitreous chamber. Its position varied at different examinations. The vision was not improved by correcting lenses.

Discussion. W. C. FINNOFF. At the first examination the lens was not seen until we had the man look down extremely to the nasal side. Next time it was on the temporal side.

Retinal Detachment.

W. M. BANE presented a man, aged fifty-nine years, who had noticed floating opacities for about one year, and who had a detachment of the lower outer third of the right retina with some vitreous opacities. The vision of this eye was 1/120, that of the left eye 5/20. Treatment with potassium iodid and subconjunctival salt injections had so far resulted in no material change.

Discussion. MELVILLE BLACK. I suspect this retina is detached by a flat tumor. It is uniformly raised, and there is no fluttering.

W. C. FINNOFF. I thought there was a wavy detachment to the temporal side and a little above the horizontal meridian. There was a parallax here between the retinal and choroidal vessels.

Hemorrhage after Cataract Operation.

MELVILLE BLACK reported the case of a woman, aged fifty-four years, in whom severe bleeding had followed cataract extraction. There had been annoying bleeding at the time of preliminary iridectomy. When the eye was dressed for the first time, four days after successful removal of the lens with the Kalt forceps, the anterior chamber was full of blood, and for several days it was manifest that fresh bleeding was constantly occurring. The blood coagulation time was six minutes. After hypodermic use of thromboplastin for three days, the anterior chamber was almost free from blood. After the thromboplastin was discontinued for a few days, fresh hemorrhage occurred. There had been no further hemorrhage after an additional seven days use of thromboplastin.

WM. H. CRISP,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Section on Ophthalmology.

January 17, 1924.

DR. T. B. HOLLOWAY, Chairman.

Vascular Anomalies at Base of Brain in Relation to Visual Field Defects.

DR. GEORGE E. DE SCHWEINITZ discussed the regional anatomy of the pitui-

tary body region, and some vascular anomalies at the base of the brain, which might be responsible for certain visual field defects. Lantern slides of colored drawings by Mrs. Chase of dissections made by Dr. J. Parsons Schaeffer in the Daniel Baugh Institute of Anatomy of the Jefferson Medical College, in illustration of the remarks, were exhibited. These illustrations had previously been utilized in the Bowman Lecture of 1913. (See Trans. Ophthal. Soc. of the United Kingdom v. p. 43/12.)

Discussion. DR. SCHAEFFER said that Dr. de Schweinitz had covered the variations of the relational anatomy of the visual pathway and the hypophysis cerebri so well, that he had little to add. Dr. de Schweinitz's presentation of the subject in general, and of the lantern slides of the anatomy based upon actual observations, must have impressed all assembled. Whether these morphologic variations at the base of the brain and skull underlie some of the eye manifestations in hypophyseal tumors is difficult to say. However, the anatomic points seem significant and appear to be in consonance with certain clinical findings.

There is one point I would stress, namely, that we hold too much to an ideal and conventional anatomy. We expect every patient in his anatomy to conform to what has been handed down as the ideal. Yet, strictly speaking, there is no ideal. We have fallen into this error partly because we follow too closely, both in studying and teaching, the elementary and general treatises on anatomy, in which the best that can be accomplished is the presentation of a more or less fixed anatomy—the anatomy of an ideal body. Of course, students of medicine and physicians in the study of a patient must needs begin from the point of view of an average or conventional anatomy. However, in practice this has very definite limitations. Extensive study of regional anatomy based upon hundreds of bodies, clearly points that anatomic variations preclude the possibility of an absolute constancy in clinical findings. My belief is that in many obscure manifestations the solution may be found in the anatomic or morphologic type or variant.

Memoir of Dr. W. W. McClure.

Dr. S. Lewis Ziegler read the biographic sketch of Dr. McClure published in full in the April number, page 320.

Sarcoma of the Choroid.

Dr. H. F. Hansell read the paper published in full in the May number of this journal, page 359.

Discussion. DR. DE SCHWEINITZ expressed the opinion that the diagnosis of detachment of the retina due to a tumor, altho often presenting apparently characteristic features, was not, in certain instances, free from difficulties. He detailed briefly the case history of two cases in which, altho the appearances were definitely those usually ascribed to a growth, after enucleation, it was found in the one instance, that the elevation of the retina had been caused by an exudation and not a morbid growth; and in the other by an exudation composed of round cells, not sarcomatous, but probably due to a chronic inflammatory process. He called attention to Sir William Lister's statement, that if there was a "hole or rent in the retina," it was most unlikely that it covered a morbid growth, that is, a sarcoma.

He agreed with Dr. Hansell that the stage at which enucleation of an eye containing a sarcoma is performed does not certainly influence the occurrence of metastasis. He referred to von Hippel's recent research, which indicated that metastases were not more frequent after operation in the second stage than after those performed during the first stage. Nevertheless, for obvious reasons, early enucleation should be performed.

DR. S. LEWIS ZIEGLER said, in regard to the question of remote metastases, he wished to call attention to the case of the late Dr. Strawbridge who retired from the Wills Eye Hospital in 1890 because of supposed melanosis of the choroid, for which enucleation was performed. A microscopic examination by Dr. Herman Knapp revealed a fibrous character that led to a favorable prognosis of nonmalignancy. This prognosis proved to be correct, as he lived comfortably for a quarter of a century, but he finally succumbed in 1914 to a recur-

rence that involved the liver and showed metastases in other portions of the body.

DR. J. B. TURNER referred briefly to a case upon which an iridectomy for glaucoma had been performed. Following this operation the wound failed to heal and a few months later the lens protruded. Later, Dr. Turner enucleated the eye. Microscopic examination revealed an unsuspected sarcoma of the choroid. Metastasis of the liver was noted eight years later.

DR. HOLLOWAY referred to a patient he had seen in consultation, who had a moderately large intraocular sarcoma situated well forward on the nasal side of the globe. While, with the pupil fully dilated, the anterior face of the growth could be noted by careful oblique illumination, studies made with the corneal microscope and slit lamp illumination proved to be very interesting. One could readily note the numerous aneurismal like dilatations of the vessels coursing over its surface, and in addition to this could readily see the formed elements of the blood coursing thru the vessels. It afforded an instance of the intraocular visible streaming in a way long to be remembered.

Cases of Focal Infection.

DR. MARY BUCHANAN reported four cases of focal infection, three of which were due to the teeth and one to tonsils.

The first case—a dentist—complained of distortion of objects, difficulty in reading, and vision right eye = 5/15. Ophthalmoscope revealed a slight hemorrhage and a number of small spots of choroiditis in the macular region. Examination showed a forgotten packing in a bad molar, upper right side, and pus in the right antrum. Under appropriate treatment, vision was improved to 5/18.

The second case—a woman age sixty years—suffered from spots in front of right eye. There were numerous discreet retinal hemorrhages and vision = 5/15, corrected to 5/12. Left eye, negative. X-ray of teeth showed four upper molars and three lower central incisors infected; these were extracted and an autogenous vaccine given. The hemorrhages rapidly absorbed, and vision improved to 5/4.

The third case—a man aged forty-two years—shopman, had a vision of counting fingers at one foot. History

showed that following exposure to oxy-acetylene welding, the eye had developed an iridocyclitis with pupil contracted and occluded. An abscess of left, upper, first bicuspid was noted by X-ray. Following extraction, considerable pus was discharged during the night. Local treatment, combined with mercurial inunctions and serobacterin injections, proved efficacious; and vision rapidly improved to 5/5.

The fourth case—a woman age fifty-years—had periodic blurring of vision in the left eye, associated with epiphora. The fields showed an enlarged blind spot, with the green field greatly limited. There was septum deviation, with bulging of ethmoid. Submucous resection, with evisceration of ethmoid, brought about an improvement of vision to 5/6. Later, following an attack of tonsillitis, patient complained of hazy vision. Fundus examination showed retinal hemorrhages and vitreous opacities. Vision = 5/5 partly. - Nine months later, patient developed several patches of choroiditis above and below disc, with reduction of vision to 1/22. Following tonsillotomy, hemorrhages gradually disappeared and vision restored to 5/4½.

Vascular Anomaly of Retina.

DR. HUNTER W. SCARLETT reported on a woman, age twenty-six, complaining of headaches. Right eye = 20/70. Left eye = 20/30. According to the patient vision commenced to fail when she was pregnant, about one and one-half years ago. External examination—negative—except for slight enophthalmos of the right eye.

Fundus examination showed disc poorly defined, and a tremendously enlarged vein, about twice that of the normal, coming off the infero-temporal side of the disc, and pursuing a tortuous course toward the lower periphery where it ends in or under a large, somewhat conical shaped red mass. The corresponding artery is notched for a short distance after leaving the disc, and it too disappears in the above mentioned red mass. The other veins are also somewhat enlarged.

To the temporal side of this red mass is a large detachment of the retina, which extends up the periphery to nearly the horizontal meridian. Numerous grayish white areas are seen to the nasal

side of the fundus, which are reticulated in places, and streaked in others.

Right eye with correction = 20/20.

Left eye with correction = 20/15.

Chronic Conjunctivitis of Unknown Origin.

DR. SCARLETT reported a man, aged thirty-one years, who consulted him because of a growth on the palpebral conjunctiva of the right upper lid. Condition has existed, to his knowledge, for about three years. Itching and burning of the eye were present, worse in warm weather and in tropical climates.

Examination revealed a grayish white, spongy growth covering the inner third of the tarsus, and part of the cul de sac. It was only slightly elevated. There were two discreet areas about 2 mm. in diameter, one in the middle and one toward the outer angle of the lid. The lesion was not ulcerated.

Smears, cultures and section of a piece of tissue, were all negative for fungus, spirochetes, or any form of protozoa. Inoculation into guinea pig, negative for T.B. Inoculation into anterior chamber of rabbit, negative for any growth. The only pathology present in sections of the tissue, was chronic inflammatory tissue, and large numbers of eosinophiles.

CHARLES E. G. SHANNON,
Clerk.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

February 18, 1924.

E. B. CAYCE, Presiding.

Toti-Mosher Operation.

DR. W. G. KENNON presented the following case: P. K. B., age 5. In October, 1922, the patient had an abscess of the left lacrimal sac. This was incised and drained. It recurred after getting well and pus could at all times be expressed from the punctum. December 16, 1922—operation for extirpation of the sac. Since operation, the child has had a succession of acute abscesses of the sac, with intervals in which there was always pus in the sac which could be expressed thru the punctum. January 22, 1924—A Toti-Mosher sac operation. January 23—Packing removed from the nose. January 25—

Wound healing without suppuration. January 31—Dressing removed. February 3—Result seems good.

Discussion. DR. ROBERT WARNER had seen this patient in October, 1922, and had diagnosed the condition as an acute dacryocystitis. This was incised and a considerable amount of pus evacuated. About two months later, all acute inflammation had subsided, but the patient had a chronic discharge. He then attempted to remove the sac. After this the condition cleared up for a short time, but soon afterwards, there developed a chronic discharging sinus. In view of the difficulties of the extirpation of the lacrimal sac, Dr. Warner is inclined to abandon this operation in favor of the Toti-Mosher procedure, as the latter seems to offer such excellent results.

DR. KENNON emphasized the following points: (1) This is the youngest patient on record upon whom a Toti-Mosher operation has been done. Dr. Mosher has operated on a child, ten years of age, which is the youngest case he has on record himself, or has heard of being operated on by this method. (2) Altho he has done this operation only twice on a living subject, yet perfect results have been achieved. This is most encouraging in view of the fact that first attempts are not ordinarily so successful as later ones. (3) Secondary operations on the sac are not usually encouraging, and are often dreaded more than the primary operation. In this case, in spite of the fact that there had been a partial extirpation of the sac and recurrent abscesses, and the operation could not be done with ordinary ease—in spite of these facts—the result was perfect.

Bilateral Chronic Conjunctivitis.

DR. HERSCHEL EZELL exhibited the case of C. W., male, age 21, who has had repeated attacks of conjunctivitis since the fall of 1922. Treatment instituted at that time, i.e. argyrol, yellow oxid ointment, and later copper sulphat, cleared up the condition temporarily. May 15, 1919 on advice of Dr. S. S. Crockett, a tonsillectomy was done by Dr. Ezell. Wassermann negative.

October 23, 1922—Refracted eyes under homatropin and prescribed glasses as follows:

R. —0.75 S.—0.25 C.ax.90° V. = 20/20.

L. —0.75 S.—0.25 C.ax.90° V. = 20/20.

May 4, 1923—Eyes more inflamed than previously. For an entire month they were treated with mild antiseptic solutions as above and were better for a while.

September 8, 1923—Patient returned with condition still worse. He was again put upon treatment which relieved the condition temporarily.

January 9, 1924—Refracted eyes. Refraction same as before. Prescribed Crookes' lenses. The patient has been seen by Drs. Savage and Cayce who advised the use of prisms, which have not corrected the condition. Dr. Cayce made a diagnosis of episcleritis which was unconfirmed by Drs. Savage and Ezell.

One puzzling feature about the case was the fact that the inflammation is quite violent for a few days and then subsides, and it can then scarcely be discovered that anything has been wrong with the eyes. In view of the absence of pathology, of the correction of the eyestrain, and the long continued treatment, he is unable to account for the long continuance of the conjunctivitis. The case is here presented with the hope that someone will offer a suggestion which will effect a cure.

Discussion. DR. W. G. KENNON asked for an expression of opinion among those present as to how many cases they had seen in which the refractive error played any part in conjunctivitis. Personally he does not believe that refraction prevents the occurrence of or assists in the cure of conjunctivitis. He has known these cases of obstinate conjunctivitis to yield to treatment of the lacrimal sac, i.e. irrigation of the sac with some mild antiseptic solution such as boric acid.

Dr. Kennon does not favor dilatation. He does not consider the passage of probes into the lacrimal sac a very successful procedure, as in the majority of instances one either produces a fistulous passage in the bony structure or causes traumatism to the mucous membrane, which has a far from beneficial effect.

DR. E. L. ROBERTS thinks that in many

instances the eyes become very much irritated if the refractive error is not corrected, and if it is corrected, they will be very much relieved. In his own personal experience he finds, that upon leaving off glasses, the eyes become very red and angry looking. He asked whether Dr. Ezell had refracted this patient after the eyes had gotten entirely from under the influence of a mydriatic.

DR. E. B. CAYCE considered this a case of episcleritis. The periods of inflammation, followed by periods during which the eyes appear practically normal, are typical of this condition. He believes these episcleral conditions to be of toxic origin, and suggested the possibility of some toxic source in this case, such as intranasal, gastrointestinal, or one of the other various other points of infection. In some instances, massage of the prostate gland has proven beneficial. Along the line of local treatment, he mentioned cacodylat of soda, or even old fashioned blue stone.

DR. FRED HASTY suggested that the patient be referred to a dermatologist for examination.

DR. EZELL stated that the refraction after the eyes had gotten from under the mydriatic was exactly the same as when done under a mydriatic. He thought favorably of Dr. Hasty's suggestion.

Choroiditis and Retinitis Proliferans

DR. J. LESLIE BRYAN showed the case of D. T., female, age 9. The patient first consulted him June 3, 1920. She had been wearing glasses for some time. Headaches following reading caused her to seek relief.

The child had always been in fairly good health, bright, happy, standing well in her classes at school. She continued to be entertained by imaginary playmates (fairies) long after the usual age for this amusement. Each of these playmates was named and would appear upon being called. The child later began to tire very easily.

R. V. 15/40. L. V. 12/30. Uncorrected.

Fundus examination: Right eye: Normal except small choroidal spots close to and to the temporal side of the nervehead, not the crescent. Left eye: Normal.

Prescribed:

R. + 1.00 S. V. 15/20.

L. + 1.00 S. + 1.00 c. Ax. 90° V. 15/20.

The nose, sinuses, ears, throat, teeth, general physical examination, including a Wassermann and urinalysis, were negative. The tonsils had been removed a few years previously. There was in the history a probability of syphilitic infection in the maternal grandparents. On the strength of this, treatment for this condition was advised. She was treated by Dr. O. N. Bryan for a few months and improved. Treatment was then discontinued.

The patient has remained under observation since that time and no change was noticed until the summer of 1923, when she began to lose weight, became restless and irritable, and threatened to kill herself, oftentimes being very despondent. Her complexion was very sallow, the headaches returned and were rather intense. Her glasses were changed, the following being prescribed:

R. + 1.50 C.Ax. 90° V.—20/40.

L. + 1.50 C.Ax. 90° V.—20/15.

Fundus examination, under cycloplegic, revealed no change. The child continued to grow worse, the headaches were not relieved. On October 12, 1923, the fundi was examined and found on the temporal side of the optic disc, in the right eye, four choroidal spots, also a large pearl gray pear shaped area with apex directed downward, with a streak of the same appearance extending quite low and connected with another pearl gray pear shaped area apex directed upward. This body or area seemed to be resting upon a tee of the same character. Surrounding the upper area was a large amount of pigment.

The patient was again referred to Dr. O. N. Bryan for examination, including urinalysis and Wassermann. The examination was negative thruout. Antisyphilitic treatment was advised. Dr. Bryan immediately began this line of treatment. The patient has improved greatly. She has no headaches, her disposition has improved, she does not tire so easily, there is marked reduction in the amount of pigment around the upper gray spot. The field of vision is practically normal.

Discussion. DR. W. G. KENNON said that the appearance of the eye suggested

either retinitis proliferans or some congenital condition. However, as Dr. Bryan had previously examined the eyes, the latter was not probable. He therefore looked upon it as retinitis proliferans of a very unusual type.

DR. E. B. CAYCE stated that this impressed him as being a case where there has been some inflammatory condition with hemorrhages, and the band between the two was evidently a constriction of fibrous tissue formed from the fibrin element of the blood. Like Dr. Kennon, he believes this to be some proliferating condition, for it is as possible to have an atypical proliferating retinitis as it is to have an atypical condition elsewhere. As to the origin, the fact, that the patient has improved so markedly under anti-syphilitic treatment, would suggest an attenuated form of lues which may show up in spite of a negative Wassermann.

DR. EZELL thought there was no question as to the condition being retinitis proliferans. The whole process is anterior to the retina, as proved by the fact that no blood vessels come over forward. With regard to its being atypical, he has never seen two cases exactly similar. This, however, is the most peculiar formation he has seen.

DR. FREY also regarded the condition of luetic origin, as indicated by the history and by the improvement under anti-luetic treatment. He suggested the sub-conjunctival injection of the cyanid of mercury.

DR. BRYAN (closing) said that the condition had surprised him, as he had refracted the patient in August under a cycloplegic and had not noticed it. Then only a short time later he discovered it with a normal pupil. Around the upper pole of this dumb bell, at the time he first discovered it, there was quite a large area of choroidal pigment showing and it was not separated by any ring at all. It was just as tho one would make a white mark on a blackboard. At the present time there seems to be a diminution in the amount of choroidal pigment and beginning cicatricial striae extending from that upper pole in all directions, except towards the lower portion. The child has improved wonderfully both mentally and physically.

DR. HILLIARD WOOD, Editor.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

March 11, 1924.

DR. ROBIN HARRIS, Presiding.

Skin Graft for Paralytic Ectropion.

W. LIKELY SIMPSON presented Miss G., 18 years, with the following history. Had L. E. removed several years ago on account of loss of vision in babyhood. Has never been able to wear an artificial eye, on account of drooping of the lower lid. There was total paralysis of the seventh nerve muscles, right side. Almost complete paralysis of the left side of face, but muscles of cheek do move somewhat. Ectropion of lower lid. Fairly good left socket. No eye.

Advised to have a plastic on lower lid to aid in prothesis. Operation was performed January 28, 1924. The skin graft was removed from the upper lid after the field was prepared on the lower lid. The graft grew satisfactorily and today a small eye was inserted in the socket.

Infected Wound of Cornea.

DR. A. C. LEWIS presented the following case: On February 5, 1924, Mr. C. M. B. was struck in the left eye by a small piece of steel. He paid little attention to it, until about thirty hours later, when he consulted Dr. Lewis for severe pain in it. At that time a small abrasion was seen on the surface of the inferior temporal quadrant of the cornea. This showed beginning ulceration and was cauterized then with carbolic acid. Atropin, dionin, and neosilvol were prescribed, and the eye was very comfortable for two days.

February 9 the wound was greatly enlarged, showed a deep slough and extensive infiltration of a large corneal area. The ulcer was burned out thoroughly with the actual cautery and the man was sent to the hospital and 2 c. c. of (skimmed) milk given hypodermically. No reaction was obtained from this. Milk injections were repeated, 2 c. c. on the morning of the 11th, and 5 c. c. more given that night, without any temperature reaction, but some relief of the severe pain in the eye and head.

February 12, Dr. Ellett saw the case

in consultation and suggested that X-ray pictures be made for a possible intra-ocular foreign body. This was done and nothing found. February 13, 5 c. c. of milk was injected. Severe reaction followed with rigor and three degrees rise of temperature. February 14, the patient was much more comfortable and photophobia decreased.

From that day the patient made an uninterrupted improvement. He was able to leave the hospital on February 20, but considerable photophobia was still present and required protection from strong light. Today the eye is still (slightly) sensitive to light, but the media are clear and the eyegrounds show no pathology. A large scar remains at the site of the ulcer, but it is becoming thinner. This involves a small part of the pupillary region with a corresponding blurring of vision. This is now about 20/150 and improving daily.

Retrobulbar Neuritis Due to Tonsil Infection.

DR. ELLETT reported two cases of retrobulbar neuritis, apparently due to tonsillar infection.

(1) Mrs. E. age 22, seen March 1, 1924, complaining of failing vision in left eye for ten days. R. normal. L. vision; fingers 1 foot, field contracted, blurred, and a large scotoma, including the blind spot, as shown. Eye normal inside and out. Wassermann negative. Sinuses and nose negative. Recurrent tonsillitis and chronically infected tonsils. General examination negative. Tonsils removed March 1st. March 5th, vision same. Ordered "mixed treatment" March 10th vision L. 20/25. Field normal.

(2) Mrs. H. age 40. Referred by Dr. Allen, of Kosciusko, Miss. on June 11, 1923. Complaining of failing vision in R. for three weeks. L. normal.

He found chronically infected tonsils, deflected septum, congenital absence of frontal sinuses and increased density in ethmoid region. Sphenoid and sella normal. Vision: fingers 1 foot. Urine showed a trace of albumin. Field showed a central scotoma extending 20° in each direction. Wassermann negative. "Mixed," and treatment of tonsils caused slight improvement. June 21st, tonsillectomy. June 30th, vision R. 20/40. An impacted root was removed,

all the teeth having been extracted. July 5th, R. 20/25. Field normal.

Plastic Operation for the Restoration of a Contracted Socket.

DR. ELLETT reported two cases of plastic operations for the restoration of a contracted socket. In both cases, the operation suggested by Dr. John Wheeler was performed. It consists in dissecting the lids free until a large pocket is made extending to the bony rim of the orbit. This is lined by a Thiersch graft, cut in one piece from the thigh, and applied over a mold of modelling compound, which is then placed in the prepared pocket. The first case was a man with extreme contraction following a burn. The result was very good and a photograph taken six months after the operation shows an artificial eye in place.

The second case was a woman, and the contraction was less, tho sufficient to prevent any but the smallest eye being worn. This is a recent case, and is not as satisfactory as the first one, some slight secondary operations being necessary to make the opening into the pocket, i.e. the palpebral fissure, sufficiently large. In both cases the entire graft took and there is no tendency for the socket to contract.

Penetrating Wound of the Eyeball.

DR. A. C. LEWIS presented the following case: Mr. G. W. J. age 47, while driving a nail on January the 30th, 1924, was struck in the left eye. When seen by me two hours later, the cornea showed a perforated wound in the nasal quadrant. The anterior chamber contained considerable blood, the iris showed a laceration beneath the corneal wound and was quite tremulous. Of course we expected a damaged crystalline lens and traumatic cataract later. The wound has healed perfectly in the cornea; the iris has healed and the scar is now seen as a clearly defined line; the pupil is normal in size and reaction to light and accommodation. The lens appears entirely normal. The vision in this eye is 20/70 today. It was 20/200 twelve days ago and will probably be normal in a few weeks.

Congenital Polytrichia.

DR. J. B. STANFORD presented the fol-

lowing case: Charles L., six years old, was brought to me by his mother because he holds his book close to his eyes and because he has "wild hairs."

This case is chiefly interesting to me because the boy has a complete extra row of cilia on each lid of both eyes. These cilia grow from the inner angle of the lid margin and all of them rub on the eyeball. They apparently replace Meibomian glands. The mother has the same condition and she tells me that her brother is likewise affected.

D. H. ANTHONY,
Secretary.

HOUSTON OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL SOCIETY.

Annual Meeting, April 1, 1924.

Subhyaloid Hemorrhage.

DR. DAILY presented a patient with a rapidly absorbing, very extensive subhyaloid hemorrhage in the right eye, in a woman fifty years of age; this hemorrhage came on while she was straining during a very constipated evacuation; her physical examination was negative.

Optic Neuritis.

DR. DAILY showed a case of marked optic neuritis in the left eye, in a woman aged 30; vision was reduced to 6/200; physical examination, blood and urine were negative, and no cause could be ascertained.

Discussion. DR. W. LAPAT reported a case of optic neuritis, with vision reduced to fingers at three feet, which cleared up on potassium iodid in two weeks. This case had negative physical findings, except for a chronic tonsillitis.

DR. W. M. STROZIER reported a case of optic neuritis following dengue.

A letter from the Houston Academy of Medicine, inviting this society to become a part of the Academy was read. After a free discussion, action was deferred until the next meeting. The secretary-treasurer's report was read and adopted. Officers were then elected for the coming year: President, Dr. W. Lapat; vice-president, Dr. P. M. Archer; secretary-treasurer, Dr. R. Daily. Board of Censors: Drs. Arnold, Slataper and Cody.

R. K. DAILY, Secretary.

Special Report

PAPERS ON USE OF RADIUM FOR DISEASES OF THE EYE.

SANFORD WITHERS, M.D.

DENVER, COLO.

This bibliography includes all papers relating to the use of radium for diseases of the eye arranged in groups according to the year in which they were published. Those intracranial conditions affecting vision are not included.

1903

- Czellitzer.** Becquerelstrahlen und Blindheit. *Berl. klin. Woch.*, 1903, p. 650.
Danyasz. *Comptes Rendus*, 136, p. 461: 1903; 137, p. 1296: 1903.
Darier. Rayons X et radium en thérapeutique oculaire. *La Clinique Ophtalmol.*, 1903, p. 315.
Hardy, W. B., and Anderson, H. K. On the Sensation of Light Produced by Radium Ray and Its Relation to the Visual Purple. *Proc. Roy. Soc.*, 1903, lxxii, 393-398.
Heineke. *Münch. med. Woch.*, p. 2090, 1903.
Stephenson, Walsh, and Mayo. Observed good results with x-rays in 1903 in treating Trachoma.

1904

- Birch-Hirschfeld, A.** Die Wirkung der Röntgen- und Radiumstrahlen auf das Auge. *Arch. f. Ophth.*, 1904, lix, 229-310. *Münch. med. Woch.*, 51, p. 1192, 1904.
Greeff. Reply to E. S. London in Regard to the Effect of Radium Rays on the Blind Eye. *Deutsch. med. Woch.*, 30:1032, 1904. Radium Rays and Their Effect on the Normal and Blind Eye. *Deutsch. med. Woch.*, 30:452, 1904.
Hardy and Anderson. *Proc. Roy. Soc. B.* 72, p. 393, 1903-04.
Leduc. Action of Radium on the Eye. *Arch. d'electric. med.*, 12:453, 1904.
London. On Radium Rays and Their Effect on the Healthy and Blind Eye; Reply to Prof. Greeff. *Deutsch. med. Woch.*, 30: 784, 1904.
 Physiological and Pathological Significance of Radium Rays; Their Relation to the Domain of Vision. *Arch. biol. nauk.*, 10:191, 1903-04. Also *Arch. f. Ophth.*, Leipzig, 57:342, 1903-1904.
Milroy. *Journal Physiology*, 30, p. 452, 1904.
Newcomet, W. S., and Krall, J. P. *N. Y. Med. Jour.*, 1905, lxxxi, p. 255; *Arch. Roentg. Ray*, 1904, ix, p. 297.
Williams. Notes on Radium; Production of the Gamma Rays from the Beta Rays of Radium; Use of Radium in Some Diseases of the Eye. *Boston M. & S. J.*, 150:559, 1904.

1905

- Birch-Hirschfeld, A.** Radium in Trachoma. (Clinical and Anatomical Experiments.) *Klin. Monatsbl. f. Augenh.*, 43, 432-497, 513, 546-8, 1905.
Block. Radium and the Eye. *Allg. wien. med. Ztg.*, 50:99, 109, 125, 1905.
Cohn, Hermann. Die Heilung des Trachoms durch Radium. *Berl. klin. Wchnschr.*, 1905, xlii, 22.
Danyasz. De l'action pathogene des rayons et des emanations emis par le radium sur

différents tissus et différents organismes. *Comp. rend. de l'Acad. des Sciences.* Vol. 138, p. 461, 1905.

Falta, W. Das Radium in der Trachomtherapie. *Wien. med. Wchnschr.*, lv, 31, 1546-1551, 1905.

Giertz. On the Effect of Radium on the Eye. *Upsala Läkaref. Förb.*, 10:400, 1904-05.

Kahler, Otto. Zur Radiumbehandlung des Skleroms. *Wien. klin. Wchnschr.*, 1905, No. 32, pp. 839-840.

Kirchner, Hans. Ueber die kosmetischen Vorzüge der Heilung von Lidkrebsen durch Radiumstrahlen und die Methode der Behandlung. *Ophth. Klin.*, 1905, pp. 145-150.

Koster. Radium in Ocular Therapeutics. *Internat. Congr. Med.*, xvii, 1905.

Milroy, T. H. The Response of the Developing Retina to Light and to Radiumemanations. *Jour. of Physiol.*, xxxiii, 69-76 and xxxiv, 1905.

Newcomet, William S., and Kroll, J. T. La radiotherapie du trachome. *Semaine med.*, xxv, 173, 1905.

Obersteiner. Arbeiten a. d. neurolog. Inst. *Wien*, xii, p. 96, 1905.

Schamberg, J. F. *N. Y. Med. Jour.*, 1905, lxxxi, p. 255.

Thielemann. Effect of Radium on Trachoma. *Ztschr. f. Augenh.*, 14, 559, 1905.

Vassioutinsky. *Russk. Vrach.*, 1905, No. 1, ref. *Arch. Roentg. Ray*, 1906, xi, p. 86.

1906

Birch-Hirschfeld. On the Physiologic and Pathologic Action of Radium, Especially from the Standpoint of the Eye. *Cong. Internat. de med.*, Sec. 2, 15:56; 126, 1906.

Bongiovanni. On the Ways of Conduction of the Radium Emanations from the Eye to the Central Nervous System. *Arch. per le sc. med.*, 30:591, 1906.

Darier. Application of Radium in Eye Therapy. *Ber. u. d. Versamml. d. ophth. Gesellsch.*, 1905, 205, 1906.

Dinger. Treatment of Trachoma with Radium. *Berl. klin. Woch.*, 43:1311, 1906.

Jacoby. Radium Treatment of Trachoma. *Deutsch. med. Wchns.*, 32:61, 1906.

Kardo-Sesoyeff. Radium in Various Forms of Trachoma. *Russk. Vrach. S.-Peterb.*, 10:605, 1906.

Kirchner. Ueber die kosmetischen Vorzüge der Heilung von Lidkrebsen durch Radiumstrahlen und die Methode der Behandlung. *Ophth. Klin.*, 1905. Ref. *Revue générale d'Ophtalmologie*, 1906.

Thiebault. Epithelioma, Episcleritis, Trachoma. *La Clinique Ophtal.*, Dec. 10, 1906.

- Trousseau, A.** Les épithéliomas des paupières, opération ou radiothérapie, *Ann. d'Ocul.*, 1906, cxxxv, 60-63.
- Zelenkovski, J. V.** Russk. Vrach, S. Peterb., 1906, v. p. 189, p. 224, p. 264. *Arch. d'Electr. Med.*, 1907, p. 150.
- 1907
- Becker.** Mit Radium geheiltes Epitheliom der Gesichtes, *Deutsche, med. Wochenschrift*, 1907, p. 1622.
- Braunstein and Samkowsky.** Radium Treatment of Trachoma. *Russk. Vrach.*, S. Peterb., 12:1053, 1907.
- Tribondeau, L. et Belle, B.** *Arch. d'Elect. Med.* 15, p. 907, 1907.
- Tribondeau, L. et Lafargue.** *C. R. de la Soc. Biol.* 63, p. 716, 1907.
- 1908
- Dominici and Barcat.** Action of Radium on the Conjunctivo-Vascular Tissue. *Cong. franc. de med. (Compt. rend)*, 1907, Paris, 435, 1908. Also *Arch. d. mal. du coeur*, 1:153, 1908.
- Fortunati e Esdra.** Action of Radium on Trachoma. *Ann. di ottal.*, Pavia. 37: 159-177, 1908.
- Pusey, W. A.** *Jour. Am. Med. Assn.*, 1908, lxxi, p. 806.
- Selenkovsky, J. W.** Zur Frage über die Heilung des Trachoms durch Becquerelstrahlen. *Arch. f. Augenh.*, Wiesb., 1908, ix, 63-92. *Russki Vrach*, 1908, p. 295.
- 1909
- Collins, Treacher.** Cure Epibulbar Epithelioma, *Ophth. Rev.* p. 187, June, 1909.
- Davidson, Mackenzie, James, and Lawson, Arnold.** A Case of Spring Catarrh Treated and Cured by Radium, *Tr. Ophthal. Soc. of the United Kingdom*, 1909, xxix, 239-245. *Oph. Rev.*, p. 181, June, 1909.
- Fortunati.** Radium Treatment of Trachoma. *Klin-therap. Wehnschr.*, 16, 565, 1909.
- Frischauer, Louis.** Une influence des rayons du radium sur la surfusion cristalline. *Le Radium*, 1909, 6, p. 161.
- Lawrence, H.** Le radium en thérapeutique oculaire. *Intercolonial Med. Journal*, 1909, p. 566. *Arch. de electr. Med.*, 1910.
- Lawson, Arnold.** Corneal Ulceration, Epithelitis, Hypopyon, Trachoma, Pannus, *Proc. Ophthal. Soc. of United Kingdom*, July, 1909.
- Lawson, A., and Davidson, D.** Radium in der Augenheilkunde, München. *med. Wehnschr.*, 1909, No. 45, p. 2348.
- 1910
- Lawson and Davidson.** Radium Therapy in Eye Disease: *Brit. M. J.*, 2:1491, 1910.
- Schindler.** Xanthelasma, Radiumbeeinflussung. *Zeitschr. f. Augenheilk.*, 1911, Bd. 25 u Zentr. f. Augenheilk, 1910, Bd. 34.
- Shine, F. W.** Case of Spring Catarrh, Treated with Radium, *New York Acad. of Med.*, Section of Ophthal., *Arch. Ophthal.*, 1910, xxxix, 145.
- 1911
- Chalupecky.** Effect of Radium Upon the Eye. *Casop. lek. cesk.*, v. Praze., 501471, 1911.
- Garcia del Mazo.** Epithelioma of the Lower Eyelid and Bridge of the Nose Treated and Cured by Radium. *Arch. de Oftal. Hisp-Am.*, 11:505, 1911. *Arch. d. Elect. Biol.*, 1911, p. 573.
- Horowitz.** cit. London, *Das Radium*, p. 98. (Action on Nerves), 1911.
- Horsley and Finzi.** *Brit. Med. Jour.* Vol. ii, p. 898, 1911.
- Koster.** Treatment of Eye Diseases with Radium. *Nederl. Tijdschr. v. Geneesk.*, Amst., 2:633, 702, 1911.
- Leprince.** *Precis d'electrotherapie et radiotherapie oculaires.* Paris, 1911.
- Ryerson.** On the Use of Radium in Ophthalmology. *Tr. Am. Acad. Ophth. & Otolaryngol.*, 15:329, 1911.
- Schindler, Otto.** Ueber Behandlung des Xanthelasma mit Radium, *Zentralbl. f. Augenheilk.*, 1911, xxv, 62-67.
- 1912
- Chalupecky.** The Action of Radium and Radium Emanation on the Visual Apparatus. *Am. J. Ophth.*, 29, 10, 1912.
- May, C. H.** Trachoma, Reported unfavorable results with minute unit of Radium, *Ophthalmology*, July, 1912.
- Ryerson.** Treated Corneal Ulcers, Epithelioma, Lenticular Opacities and Opacities of Vitreous. *Ophth. Year Book*, p. 37, 1912.
- Schnaudigel, Otto.** Zur Radiumbehandlung der Conjunctivitis Vernalis, *Klin. Monatsblat. f. Augenheilk.*, ii, 620-623, 1912.
- Wessely, K.** Ueber das Verhalten von Uraten in der vorderen Augenkammer unter der Einwirkung von Radiumemanation und ohne dieselbe, *Verhandl. d. Kong. f. inn. Med.*, xxix, 219-222, 1912.
- 1913
- Chalupecky.** The Effect of Radium and Radium Emanation on the Eye. *Arch. f. phys. Med. u. med. Techn.*, 7:185, 1912-13.
- Fleming.** Trachoma, Asthenic Corneal Ulcers, *Ophth. Year Book*, p. 31, 1913.
- Fleming.** Experimental and Clinical Studies on the Action of Radio-active Rays in Eye Diseases. v. Graefe's *Archiv fuer Ophthalmologie*. Vol. 84, pp. 345-400, 1913.
- 1914
- Abelsdorff, G.** Die Wirkung des Thorium X auf das Auge, *Klin. Monatsbl. f. Augenh.*, 1914, liii, 321-334.
- Cameron, William H.** Radium in the Treatment of Cancer. *Radium Vol. IV*, No. 3, Dec. 1914. (Melanotic Sarcoma, p. 49, Carcinoma of the Eyelid, p. 54).
- Fisher, Carl.** Epithelioma of the Lids, *Jour. Am. Med. Assn.*, August 29, 1914, lxiii, 751-755.
- Flemming.** Radium und Mesothorium in der Ophthalmologie, *Strahlentherapie*, 1914, iv, 681-707.
- Mattice.** Epithelioma of the cornea treated with the barium carbonate salt of radium. *Arch. of Ophth.*, v. 43, 237, May, 1914.
- Newcomet, W. S.** Radium and Radiotherapy, Philadelphia, 1914, Lea and Febiger, p. 276; *Am. Jour. Roentg.*, 1914, i. p. 153.
- Pinch, A. E. Hayward.** The Work Carried out at the Radium Institute, London, in 1914, *Radium*, Vol. V, No. 2, May 1915. (Spring Catarrh).

Simpson, Frank E. Radium in the Treatment of Blastomycosis. *J. A. M. A.*, Vol. 62, pp. 844-5, 1914. (Inner canthus of left eye.)

1915.

Clapp, Edmund W. Progress in Ophthalmology, Boston Med. and Surg. Jour., January 7, 1915, clxxii, No. 1, pp. 22-23.

Colwell, H. A. and Russ, Sidney. Radium, X-rays and the Living Cell, p. 223-225. G. Bell and Son, Ltd., 1915.

Deutschmann, D. R. Ueber intraokularen Tumor und Strahlentherapie, *Ztschr. f. Augenh.*, 1915, xxxiii, 206-209.

Küpfeler and Szily, A. von. Ueber Strahlentherapie bei Hypophysentumoren, *Deutsch. med. Wehnschr.*, July, 1915, xli, No. 31, pp. 910-911.

1916.

Abbe, R. Radium Efficiency in Non-Malignant Surgical Conditions. (Vernal Catarrh.) *Med. Rec.*, N. Y., 1916, vol. xc, No. 2, July 8, 1916, pp. 47-50.

Darier, A. *Rev. de Therap. med.-chir.*, 1916, lxxiii, p. 115.

Escalada, Pedro Castro. *Curieterapia*, ii, 204, 189, 199, 782, 701, 190, 191, 509, 208, 203, 189, 202, 1916.

Heckel, Edward B. Report of a Case of Melanosarcoma of the Orbit, Treated with Radium, *Arch. Ophth.*, xlv, pp. 465-468, 1916.

Kennedy, Thomas C. Radium Treatment of Epithelioma of Lids. *J. Ind. St. Med. Assn.*, vol. ix, July 1916, p. 298.

Mackee, George M. Progress in the Treatment of Skin Diseases. *N. Y. Med. Journ.*, vol. ciii, No. 10, pp. 441-4, March 4, 1916.

Pinch, A. E. Hayward. A report of the Work Carried out at the Radium Institute, London, *Radium*, vol. ix, No. 5, Aug. 1917. (Capillary Nevus, Spring Catarrh, Glioma, Xanthelasma, Trachoma.)

1917.

Allport, Frank. Some Remarks Concerning Vernal Conjunctivitis, *Ophthal. Rec.*, 1917, xxvi, 395-396.

Burns, Frederick, and Blaisdell, J. Harper. The Use of Radium in the Treatment of Cutaneous Epithelioma and Keratosis Senilis. (Epithelioma of Lids.) *The Boston Med. and Surg. J.*, clxxvi, pp. 774-776, May 31, 1917.

Burrows, Arthur. Work of the Manchester and District Radium Institute, *Radium*, vol. xi, No. 2, May 1918. (Spring Catarrh.)

Butler, T. Harrison. Some Remarks upon Spring Catarrh, with Special Reference to Its Diagnosis and Its Treatment with Radium, *Brit. Jour. Ophthal.*, 1917, i, 411-415.

Report case Melanoma, *Br. Jour. of Ophthal.* p. 64, January, 1917.

Cuperus, N. J. Mesothorium in Diseases of the Eye. *Arch. Ophth.*, 46:126, 1917.

Pusey, W. A. The Principles and Practice of Dermatology, 3rd ed., N. Y., 1917, D. Appleton and Co., p. 446.

Sweitzer, Samuel E. An Analysis of Forty-three Cases of Skin Cancer. (Carcinoma of Eyelids.) *J. A. M. A.*, vol. lxix, 179-180, July 21, 1917.

T. H. Butler. Radium in Diagnosis and Treatment of Vernal Conjunctivitis. *Brit. J. Ophth.*, 1:411, 1917.

1918.

Cohen, Martin, and Levin, Isaac. The Action of Radium on Cataract, *New York Med. Jour.*, July 6, 1918, cviii, 4-5.

Duncan. Glioma of Retina, 3 Cases Treated with Radium. *Am. J. Ophth.*, 1:715, 1918.

Gifford, S. Leukosarcoma of Iris Treated by Radium. *Arch. Ophth.*, 47:241, 1918.

New, Gordon B. The Value of Radium in the Treatment of Lesions of the Eye, Ear, Nose and Throat, *Canad. Med. Week.*, 1918, pp. 23-28.

Pusey, W. A. Treatment of Vernal Conjunctivitis with Radium. *J. A. M. A.*, 71:806, 1918.

Shumway. Radium Treatment of Vernal Conjunctivitis. *Am. J. Ophth.*, 1:404, 1918.

1919.

Bell and Tousey. Non-Operable Tumor of Orbit and Brow Treated Successfully with Radium. Report of Case with a Few Remarks. *Arch. Ophth.*, 48:531, 1919.

Bertolotti, Mario. Radium Therapy of Tumors of the Hypophysis with Acromegaly, *La Radiol. med.*, 1919, vi, 315, Abst. in *Arch. Radiol. and Electroth.*, Jan., 1921, p. 254.

Cohen and Levin. The Action of Radium on Cataracts. *J. A. M. A.*, 73:1193, 1919.

Knox, Robert. Radiography and Radiotherapeutics, vol. ii, London, 1919.

Shumway. Treatment of Vernal Conjunctivitis by Application of Radium. *Penn. M. J.*, 22, 793, 1919.

Terrien and Ledoux-Lebard. Use of Radium and X-rays in Ophthalmology. *Ann. d'ocul.*, 156:364, 1919.

1920.

Franklin and Cordes. Radium for Cataract. *Am. J. Ophth.*, 3:643, 1920.

Janeway. Therapeutic Use of Radium in Diseases of Eye. *Arch. Ophth.*, 49:156, 1920.

Levin. Technic of Radium Application in Cataracts. *Am. J. Roentgenol.*, 7:107, 1920.

Montgomery, Douglas W. and Culver, George D. The Action of Radium on a variety of Cutaneous Conditions. *Arch. of Derm. and Syph.* Vol. ii, No. 4, Oct., 1920.

New and Benedict. Radium in Treatment of Diseases of Eye and Adnexa. *Am. J. Ophth.*, 3:244, 1920.

Schamberg, J. F. *Am. Jour. Electrother. and Radiol.*, 1920, xxxviii, p. 239.

Vigano. The Advantages of Radiotherapy in Ocular Lesions Following Wounds and in Detachment of the Retina. *Radiol. med.*, Milano, 7:223, 1920.

1921.

Burrows, Arthur. A Report of the Work at the Manchester and District Radium Institute, 1921. (Spring Catarrh.)

Chance. Radium Plugs for Dissolution of Orbital Gliomatous Masses Developing after Excision of Globe, *Am. J. Ophth.*, 4:641, 1921.

- Duncan.** Primary Epithelioma of the Cornea with Treatment. *Am. J. Ophth.*, Vol. 1, No. 7, July 1921.
- Recent developments in Radium Therapy. *Calif. St. Jour. of Med.*, July 1921.
- Franklin and Cordes.** Radium Applicator for Cataracts. *Am. J. Ophth.*, 4:429, 1921.
- Frazier.** Control of Pituitary Lesions, as Affecting Vision, by Combined Surgical-X-ray-Radium Treatment. *Arch. Ophth.*, 50:217, 1921.
- Horner.** Vernal Conjunctivitis Treated with Radium. *U. S. Nav. M. Bull.*, 15:128, 1921.
- MacKee, G. Millar.** X-ray and Radium in the Treatment of Diseases of the Skin, p. 211. Lea and Febiger, Philadelphia, 1921.
- Pinch, A. E. Hayward.** A report of the Work Carried out at the Radium Institute, London, 1921. (Spring Catarrh.)
- Quick.** Radium Technic in the Treatment of Malignant Diseases of the Skin. *Arch. of Derm. and Syph.*, 4:322-341, September 1921.
- de Schweinitz.** Small, Spindle-Celled Hemangiosarcoma of Eyelid of Child Aged 5 Months, Excision Followed by Radium Treatment. *Am. J. Ophth.*, 4:91, 1921.
- Specht, F.** A Case of Concomitant Carcinoma of the Mucous Membrane in Xeroderma Pigmentosum. *Arch. f. Ohren, Nasen, u. Kehlkopfheilk.*, 108:219, Leipzig, November 1921.
- Withers.** Carcinoma of the Eyelids Treated with Radium. *Am. J. of Ophth.*, Vol. 4, No. 1, January 1921.
- 1922.
- Barcat, J.** Radium in Dermatology, *Paris Méd.*, 12, 106, February 4, 1922.
- Bundy, Allen.** A New Radium Applicator for the Treatment of Cataracts. *Am. J. of Roentgenol.*, 9:775, 1922.
- Duncan, Rex.** Superficial Epitheliomas with Results and Observations in the Treatment of More than Five Hundred Cases with Radium. *Urol. and Cutan. Rev.*, 26, 19, January 1922.
- Fernandez, R.** Radium therapy in eye, ear, nose and throat work, *J. Philippine Islands*, M. A. 2, 116-120, May-June, 1922.
- Jendralski, Felix.** Results of Roentgenotherapy of Experimental Tuberculosis of the Anterior Segment of the Eye. *Arch. f. Ophthal.*, Berlin, 110, 168, Dec. 9, 1922.
- Jonquieres, E.** Tolerance of eye for Radium. *Rev. Assoc. Med. Argent.* 34, 1247-1250, November 1921; *ab. J. A. M. A.*, 78, 1351, April 29, 1922.
- Kelen, Bela.** Roentgenotherapy in Ophthalmology, *Orvosi hetil.*, Budapest, 56, 24, Suppl., Oct. 29, 1922.
- Morrow, Howard and Taussig, Lawrence.** Epitheliomas of the Face and Their Treatment with Radium. *Arch. Dermat. & Syphilol.*, 5, 73, January 1922.
- Müller L. and Högl, F.** The Cure of Trachoma by Radium. *Wien. klin. Wchnschr.*, 35, 954, Dec. 7, 1922.
- Pancoast, Henry K.** Treatment of Brain Tumors by Radiation, *Am. Jour. Roentgenol.*, 1922, ix, 42-47.
- Pinch, A. E. Hayward.** A Report of the Work Carried out at the Radium Institute, London, from January 1, 1922, to December 31, 1922. (Spring Catarrh.)
- Rados, A. and Schinz, H. R.** Animal Experiments on the Roentgen Sensitiveness of the Different Parts of the Eye. (Considers also Radium) *Graefe's Arch. f. Ophth.*, Dec. 23, 1922.
- Simpson, Frank Edward.** Radium Therapy, pp. 85, 86, 147, C. V. Mosby Co., 1922.
- Taft, Robert.** Radiotherapeutics in Skin Cancer, *Urol. and Cutan. Rev.* 26, 55, January 1922.
- 1923.
- Aikins, W. H. B.** Radium in Sarcoma, *J. Radiol.*, 4, 44, February 1923.
- Beclere, A.** Radiotherapy of Brain Tumors, *Paris méd.*, 13, 97, Feb. 3, 1923.
- Butler, T. Harrison.** A Dermoid of the Cornea. *Arch. of Ophth.*, Vol. III, No. 5, September 1923.
- Crowe, S. J. and Baylor, John W.** Benign Malignant Growths of the Nasopharynx and Their Treatment with Radium. *Arch. Surg.*, 6, 429, March 1923.
- Green, John.** Basal Cell Carcinoma of the Orbit and Ethmoid; operation; Radium Application. *Arch. of Ophth.*, Vol. III, No. 1, January 1923.
- Hernandez, Pablo.** Vernal Conjunctivitis Treated with Radium. *Arch. de oftal. Hispano-am.*, Barcelona, 23, 388, June 1923.
- Knapp, Arnold.** Metastatic Thyroid Tumor in the Orbit. *Arch. of Ophth.*, Vol. 3, No. 1, January 1923.
- Krull, C. A.** Roentgen Therapy in Ocular Tuberculosis, *Nedrl. Tijdschr. v. Geneesk.*, Haarlem, 67, 630, Feb. 17, 1923.
- Loucks, R. E.** Indications for Radium Therapy in Ophth-Oto-Laryngology. *J. of The Mich. St. Med. Soc.*, February 1923.
- Marin Amat.** A Severe Tarsal Form of Vernal Conjunctivitis Cured with Radium, *Siglo med.*, Madrid, 71, 234, March 10, 1923.
- Martin, Paul.** Primary Gliomas of the Chiasm and Optic Nerves in their Intracranial Portion. *Arch. of Ophth.*, Vol. 2, No. 3, May 1923.
- Morgan, James A.** Neuroepithelioma, or Glioma of Retina. *Am. J. of Oph.*, Vol 6, No. 6, June 1923.
- Morrow, Howard, Taussig, Lawrence.** Statistics and Technic in the Treatment of Malignant Diseases of the Skin by Radiation. *Am. J. Roentgenol.*, 10, 212, March 1923.
- Neeley, S. D.** Combination of X-ray and Radium Therapy in the Treatment of Superficial Malignancies of the Face, *Jour. Oklahoma State M. A.*, 16, 212, July 1923.
- Prendergrass, E. P. and Ravdin, I. S.** A Report of Two Cases of Malignancy in Xeroderma Pigmentosum and Their Response to Radium. *Urol. & Cutan. Rev.* 27, 207, April 1923.
- Quigley, D. T.** The Treatment of Superficial Cancer, with Statistics and Technic. *Am. J. Roentgenol.*, 10, 161, February 1923.
- Terry, Ted. L.** Neurogenetic Tumors of the Retina and Optic Nerve; Gliomata. *Texas St. J. of Med.*, Vol. xix, No. 7, November 1923.

American Journal of Ophthalmology

Series 3, Vol. 7, No. 7.

July, 1924

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

EDITORIAL STAFF

EDWARD JACKSON, Editor,
217 Imperial Bldg., Denver, Colo.
M. URIBE-TRONCOSO,
226 W. 70th St., New York City.
MEYER WIENER,
Carleton Bldg., St. Louis, Mo.

CLARENCE LOEB, Associate Editor,
25 E. Washington St., Chicago, Ill.
CASEY A. WOOD,
7 W. Madison St., Chicago, Ill.
HARRY V. WURDEMANN,
Cobb Bldg., Seattle, Washington.

Original papers, correspondence, and other scientific communications should be addressed to the Editor. Books for review may be sent to any member of the editorial staff. Reports of society proceedings should be sent to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Ill.

Proof should be corrected, and returned within forty-eight hours to the printers. Reprints may be obtained from the printers, Tucker-Kenworthy Co., 501 S. La Salle St., Chicago, Ill., if ordered at the time proofs are returned. But reprints to contain colored plates must be ordered when the article is accepted.

Copy of advertisements must be sent to the Manager by the fifteenth of the month preceding its appearance.

The annual subscription for the JOURNAL and the OPHTHALMIC YEAR BOOK is eleven dollars, in advance.

Subscriptions, applications for single copies, communications with reference to advertising or other business, should be addressed to the Manager of Subscriptions and Advertising.

JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

OPTIC NERVE ATROPHY WITH TABES.

The above title is chosen, rather than the more common phrase "tabetic atrophy," because it is believed to be more appropriate and truthful. A title should be short, but it is even more important that it be accurate. We doubt if there is an optic atrophy that can properly be called "tabetic". There is no atrophy of the optic nerve that is an essential part of tabes, or any form of such atrophy that is peculiar to tabes, either in its clinical manifestations or in its pathologic changes.

In origin, structure and significance, the optic nerve differs essentially from the spinal nerves. It is not a peripheral nerve in the scientific sense, but a part of the central nervous system. Embryologically, it is a commissure connecting the highly developed nerve center called the retina with the intracranial nerve centers. There is *a priori* reason to suppose that its pathologic processes will resemble those that attack the central nervous system, rather than those which attack the peripheral nerves.

When the view was generally held that degeneration of the posterior columns of the spinal cord was the

primary lesion of tabes dorsalis, it was logical to suppose that a similar degeneration of the optic nerve was the probable basis of atrophy of the optic nerves that accompanied tabes. But the view of primary degeneration in the posterior columns, as the original lesion of tabes, is now given up by neuropathologists; and such change is held to be secondary to the lesions of the posterior roots of the spinal nerves. The disagreement and discussion now centers chiefly on the nature and order of these root lesions. Whether tabes begins with degeneration of the neurons in the posterior root ganglion, or where the dura and arachnoid fuse outside the pial sheath, it is generally held that the root lesions occur before the degeneration of the commisural tracts within the spinal cord.

*According to Fuchs (J. A. M. A., 1920, v. 75, p. 227), optic atrophy occurs in about ten or fifteen per cent of tabetics. The old observation that patients becoming blind from optic atrophy early in tabes, suffered but slight disturbance of locomotion, or very slow progress of the ataxia, has been thought to show some interrelation between the tabes and the optic atrophy. But it is much more reason-

ably explained on the supposition, that in such cases the ataxia was due, not to typical tabes, but to other postsyphilitic lesions, or even by the blindness removing a factor in coordinated movements that proved disturbing, when the afferent impulses that have to do with station were altered, or failed to play the proper role when vision was temporarily eliminated by closing the eyes, or diverting sight to other uses.

The ophthalmoscopic appearances of atrophy of the optic nerve in cases of tabes are not uniform. Gray atrophy is spoken of as typical. But discs that are chalky white may be seen in tabetics. In some cases the ophthalmoscopic changes may be more striking than the failure in visual acuity or fields. But in other cases this is not found. The stage in the course of tabes, at which these appearances are noticeable, varies most widely; and by Fuchs' estimate, in eighty-five to ninety per cent of the cases they do not appear at all.

The differences in the fields of vision are, if possible, even greater than in the other clinical signs. Paton says (Brit. Jour. Ophth., July, 1922) "On looking over a series of visual fields in tabetics, one cannot help being struck by the remarkable variability that they show and the marked disproportion that exists in different cases between the loss of visual acuity and the loss of visual field." This variability is most evident when Paton attempts to classify such fields, either into the two simple groups of Uhthoff, or the more minute subdivisions of Stargardt, which he illustrates with cases and states as follows: "1. Peripheral loss of white and colors with simultaneous loss of function in other parts of the field. With advancing peripheral loss, the visual acuity falls and at the same time, the distinction between red and green, and later blue and yellow. 2. Peripheral loss of white and colors with good function in the untouched fields. 3. Peripheral loss of colors with full fields for white. Visual acuity may be normal or diminished. 4. Partial (sectorial) loss with more or less perfect functioning in the rest of the field.

5. Normal limits to the peripheral fields with diminished visual acuity and color sensation. 6. Central scotomata. 7. Hemianopic defects."

As to the pathology of "tabetic atrophy", Paton says: "It must now be allowed that all the manifestations of syphilis are due to the local production of toxins in the presence of the spirochete." It has been debated whether the toxin acts directly on the nerve tissue, causing parenchymatous degeneration, "or primarily on connective, vascular and lymphatic tissues with a consequent secondary nerve degeneration." Paton believes that nervous, vascular, connective and lymphatic tissues suffer directly from the toxin; and this is in harmony with the later views in regard to the causation of general paralysis. The toxins of the spirocheta or treponema pallida have a wide range of pathologic influence. Tabes dorsalis is one late manifestation of the luetic poisoning, atrophy of the optic nerve is another. In a certain minority of cases, they co-exist, as do optic atrophy and the Argyll Robertson pupil, or iritis and the luetic eruption on the skin. The connection between them is merely that they arise from a common cause. The name "tabetic atrophy" was given when it had not been fully recognized that tabes itself was caused by syphilis.

E. J.

NEED OF PROPER CLASSIFICATION FOR ACCURATE DIAGNOSIS.

The successive mental steps necessarily taken by the physicians, to arrive at the diagnosis of a given morbid entity, represent a very complex process. When the type of disease is one of the common varieties, he immediately associates his mental picture of cases previously seen, or at least his recollections of descriptions previously read in textbooks or monographs, with the present condition of the patient.

Clinical training consists chiefly in obtaining visual, aural and tactile mental images of actual symptoms, to build around them according to their

character, importance, course, and sequences, a completed structure, to which a name is applied, which will characterize and differentiate this from other morbid conditions.

These mental images are recorded, stored, and afterwards used to make a diagnosis, comparing and superimposing them to the actual symptoms observed in the patient under examination. We identify a disease when, by noticing the resemblances and differences with regard to a standard recognized type, it is found the resemblances are far more numerous than the divergences.

This process is similar to the old and well established methods of classification used with such excellent results in Natural History, especially in Botany and Zoology. In these sciences, to classify is to place a given specimen in its proper relationship with other types; arranging them in order, according to their properties and peculiarities.

The specimen is first assigned to one of the larger divisions, i.e. to the class or group; and then by comparison, analogy or gradual exclusion, to the lower subdivisions of orders, species and varieties. When all the characters of the specimen agree with those of the classical type, it is immediately and automatically identified; that is, assigned to its proper place, and a name is given to it.

In medicine however, almost never have the same morbid types of species a complete or perfect analogy of characters and peculiarities. Every patient reacts to the morbid agent in his particular way, and gives to the pathologic complex special features far different from those of other individuals; and therefore different from the classical grouping of symptoms ascribed to a particular disease. Still, the fundamental conditions are retained, and around them, allowing sufficient laxity for individual differences, our medical classifications are securely built.

After detecting the several symptoms, the functional disturbances and the apparent lesions, we try to differentiate the process from others capable of attacking the same organs;

that is, we make a diagnosis first by analogy and then by exclusion. In the common types of disease the first, or direct method, is generally sufficient; but in rare conditions the second becomes necessary and in some cases indispensable.

Wrong diagnoses are due mainly to lack of knowledge, but frequently to faulty methods of classification. In difficult cases when the method by analogy fails, we come to a stop and begin to guess; or by wrong interpretation of symptoms are lead to faulty generalizations. In such conditions a review of all the little known types and new varieties will solve the riddle by the exclusion method.

When the Ophthalmologist becomes more and more expert, and gathers a larger collection of mental impressions of particular diseases, the number of guesses decreases considerably. However, in the beginning the student is confronted with such a mass of symptoms and details that, even being a good and conscientious worker, he has considerable difficulty to extricate the basic or dominant facts from the bulk of secondary and even contradictory signs.

The best way to arrive at an accurate diagnosis is by a classification. Unfortunately very little stress is laid on this matter in practice, and the result is the somewhat hazy understanding of morbid conditions which exists in the student's mind and is apparent in his descriptions and wrong interpretations.

A patient comes, for instance, with an opacity in the cornea. The student generally rushes to give a name to the disease, sometimes even disregarding the previous history. He compares his actual impressions as a whole with his mental pictures of apparently similar cases, and jumps to a conclusion.

A much better way, undoubtedly, consists in ascertaining first what are the basic symptoms at the root of the trouble; and assigning them to the larger divisions of corneal diseases. The first question should be: "Is the opaque spot an active inflammation, a repair process (that is scar tissue), or a retrograde lesion?"

If the first condition exists, then we must decide if it is of the ulcerative or nonulcerative kind. The latter being recognized, for instance, it would be necessary to find out the next subdivision, whether it is a superficial, epithelial or subepithelial lesion, or whether it is one of the deeper forms. The former being recognized, we must find out, so to speak, the "order"—vesicular or nonvesicular, and at last, all the symptoms considered, the species—herpes febrilis or herpes zoster, or dendritic keratitis, etc. in the first case, keratitis punctata superficialis, pannus, etc. in the last.

This process of reasoning is more scientific and practical, and should always be taught instead of the simple enumeration and description of endless types of diseases, without slight or any apparent connection between them, which the student needs to memorize individually.

There are, of course, in the actual state of our knowledge, many forms of disease which cannot be grouped together; on account of the unique characteristics they present, or because they have not been thoroly studied. These must be placed, by enumeration, at the end of the groups with which they mostly agree. Such are for instance filamentary keratitis, superficial linear keratitis (letter shaped keratitis) keratitis marginalis profunda, etc., etc.

Unfortunately our medical classifications cannot be made under uniform standards, as is the case in Botany or Zoology. The incompleteness of our knowledge on the one hand and the requirements of a practical grouping on the other, makes it imperative to change from the pathologic to the etiologic standards, from the physiopathologic conception of the lesions to the nature of the injuring agent itself.

This change is necessary because the same pathologic lesions can be produced by different morbid agents, and on the other side an injuring agent is able to originate different pathologic changes. With our improved methods of examination, general and special (including particularly the slit lamp), we shall probably be able to

make in future more accurate etiologic diagnoses, which are really our goal for a standard classification.

In the group of iritis for instance, the pathologic division of serous, plastic and purulent, is only a valuable help to a higher classification, dividing the iritic inflammations into primary and secondary; the first group according to the infectious agent:—syphilitic, tuberculous, gonorrheal, etc., and the metabolic troubles as diabetes or gout; the second group as a result of a local or neighboring condition which causes the infection; as traumatic or sympathetic iritis, or due to a keratitis, etc. There will remain, however, many cases of iritis of obscure and unknown origin; which do not have a place in the above groups, and need to be recognized and classified as such by exclusion.

Great strides have been made recently in the chapter of choroidal and retinal diseases by a closer study and interpretation of the local changes observed in the fundus. The nutritional characteristics of the inner and outer layers of the retina and of the posterior and anterior parts of the choroid, have led to a better understanding of pathologic changes and the drawing of well marked lines of distinction, in the majority of cases, between retinitis and choroiditis, between inflammatory and degenerative changes.

In order to take full advantage, however, of any classification, it is absolutely necessary not only to be perfectly acquainted with the principal types of disease, but also to know, at least in a general way, the rare and new forms, to be able to exclude the former and review the latter, until a suitable place has been found for the actual condition.

Nobody can make an accurate diagnosis in a difficult case if he does not know all the species and varieties under one special subdivision. Ignoring them, either he makes a wrong guess or else, what is indeed unfortunate, he considers the case as a new and never observed disease.

I remember some years ago to have seen a case of corneal disease which was absolutely puzzling to me, never

having seen anything like it. I tried to classify it, and find out in which division or group it could be placed. It was certainly a superficial opacity of the epithelium of the cornea and perhaps of the stroma, with dark points which resembled small vesicles. The review of several textbooks and encyclopedias was of no avail for the purpose; but in recent literature I found the description of a new disease which Professor Fuchs had called epithelial dystrophy of the cornea, and whose symptoms entirely agreed with those of my patient. The report I made of this case was useful at that time, being one of the first observed. Today a whole group of dystrophies of the cornea has been added to our classifications, embracing such rare disturbances as nodular opacities, lattice shaped opacities, senile marginal atrophy and some others.

Classification or diagnosis may be made: 1st in a direct way from the existence of one or more symptoms or prominent characteristics. 2nd by differential method comparing the symptoms of diseases of similar character, and 3rd by exclusion, separating or excluding all other known conditions from the actual case. The habit of systematization once acquired, there is less mental work to do, less guessing, confusion and misunderstanding. It is by far the more scientific method of approach to the everyday problem of distinguishing, recognizing and interpreting a given morbid complex.

M. URIBE TRONCOSO.

THE LONDON CONVENTION

So long as an International Congress with full international cooperation and good will is not possible, gatherings of ophthalmologists, such as that planned to be held in London a year hence, should receive the widest and most hearty support. The London "Convention" can offer practically all of the advantages of an international congress and will be free from its most serious handicaps.

The invitation to participate goes out to every quarter and every climatic zone of the world. Discussion on any

ocular condition, generally distributed like cataract or trachoma, may receive contributions from those who encounter it under most diverse conditions. Conditions limited to certain districts, as the eye lesions of onchocercosis, tropic asthenopia, or snow blindness, can be described by those who have had large experience with them. The observations of workers in the best European or American clinics can be compared with those of pioneers in ophthalmology in Egypt, India, South Africa or China.

To get rid of the difficulties of various languages is to lessen greatly the labors of those who arrange for the "Convention"; and to enhance the profit and pleasure of those who attend. Many, who can understand fairly well a language other than the one they habitually use, find it very difficult or impossible to express themselves in it correctly, or at all. Those who address an English speaking convention will, of course, speak in English. Those who listen will hear correctly and with the least exertion. In a congress with even three official languages, there is always a certain proportion of the listeners, and sometimes a majority, who do not understand what is being said, and for some who understand, comment or reply cannot be attempted.

Undoubtedly, consciousness of the difficulties inherent in the use of several languages has kept down the attendance at international congresses. From the numbers who have assembled for them, it is hard to estimate what the attendance will be at this English speaking convention. Egyptians, Hindus and Chinese, educated in ophthalmology by English speaking teachers, can take their full part in the program. Ophthalmologists of the United States, Canada, Australia and South Africa, and many English speaking colleagues of Continental Europe, will welcome the opportunity to meet and discuss ophthalmic topics with those of Great Britain.

Nor will it be any single or narrow school of ophthalmology that will dominate the discussions of the London meeting. In this respect, it will

be markedly more widely representative than the single language congresses of the past. The literature of ophthalmology, now open to readers of English, is world wide; and among those in attendance will be many who have profited by their contact with the great teachers of Vienna, Paris and Berlin, or of Italy, Spain, Switzerland, Scandinavia, Belgium and Holland. The meeting at London will mark an era in the associated activities of those interested in ophthalmology.

E. J.

BOOK NOTICES.

Section on Ophthalmology of the American Medical Association. Pre-session Volume for 1924. Paper, 298 pages, illustrated. Chicago, American Medical Association.

This volume, issued a full month in advance of the Chicago meeting of the Association, June 9-13, contains the nineteen papers to be there presented, with the reports submitted by four committees. It is to be noticed, that of the twenty-two authors of these papers, four authors of three papers are women; a proportion that has never before been shown. Only two papers have been presented by women before this Section in the last 33 years.

The reports of the Committees deal with hereditary blindness, physical standards for drivers of motor vehicles, the Knapp Testimonial Fund and local anesthesia in ophthalmic work. The latter is the report of a special committee of the Section, and deals with the subject somewhat differently from the summary of the general committee's report, published last month (p. 477).

The plan of seeking papers among those who have not contributed to former meetings of the Section; but above all to require them to present scientific work of real value; and especially the requirement that every paper shall be submitted to the Executive Committee before it is given a place on the program, has secured and maintained for the Transactions of this Section of the A. M. A. a very high standard of value and interest.

E. J.

Nistagmus Ocular. Raúl Argañaraz, M. D. Professor of Ophthalmology in the Faculty of Medicine of Buenos Aires. Paper, large 8vo., 314 pages, 65 illustrations. Buenos Aires, A. Guidi Bufarini.

A continent like South America, with many nations and many languages, cannot have a single center of scientific activity. But among the South American centers of ophthalmology, Buenos Aires, with its 1,700,000 inhabitants, the largest city in the southern hemisphere, easily ranks first in professional activity and literary output. It will not be long before the publication of important scientific books in that metropolis will occasion neither surprise or comment.

This monograph on nystagmus is clearly the most complete and up-to-date treatise on the subject now extant. In general, the authors of the western hemisphere are keenly alive to what goes on in Europe; but it is less common for the scientists in the laboratories and libraries of Europe to be as well posted in regard to what advances are made along their especial lines in other quarters of the globe. The book before us might well be translated into English as the best summary of the present knowledge regarding its subject.

The scope of the work is well shown by its chapter headings. The introduction gives a very brief history of recent progress in knowledge of the subject. Chapter I, thirty-two pages, takes up: Definition, Varieties, Rapidity of Oscillation, Morphology, Undulatory and Pendular, Rhythmic and Resilient Nystagmus. Under nystagmography are given the ways of studying it, objective, graphic, pneumatic, photographic, cinematographic, and direct. Then a quarter of the chapter is devoted to the vision of nystagmus.

Chapter II deals with classification. Then a chapter is given to each of the following forms of nystagmus: Physiologic, congenital, vestibular, cerebral and cerebellar. Chapter VIII gives its twenty pages to the clinical diagnosis of nystagmus, and Chapter IX, sixteen pages, is on miners' nystagmus. The final chapter gives an account of

the author's studies of experimental nystagmus in rabbits.

The illustrations are chiefly reproductions of photographs, printed on thirty-two insert plates. This permits the use in the book of a soft paper with dull surface, that takes the large type letter-press in a way that must rejoice the heart of the presbyope. Each chapter is supplied with its bibliography and these bibliographies give the work high value as one of reference. The language in which the text is written is characterized by the simplicity and directness of the best Spanish. If one wishes to learn to read the language, here is a book to begin with. It is a most welcome addition to ophthalmic literature.

E. J.

Diseases of the Optic Nerve at the Government Ophthalmic Hospital, Madras, during 1919-1922. Paper, quarto, 64 pages, Madras, Government Press, 1923.

In the March number (p. 242) was noticed a pamphlet almost exactly similar to this, which contained notes of cases of diseases of the choroid and retina. Instead of a title page, is given the same list of abbreviations; and the remaining pages are filled with notes of cases arranged in similar tabular form. The same column headings are used; and there is the same absence of any attempt to classify and arrange separately the different disorders of the optic nerve.

There are 408 cases here recorded. Of these 177 cases gave a history of consanguinity of parents, for one or more generations, or that consanguinous marriages were the usual custom in the patient's family. There was a history of syphilis, or some clinical evidence of it or a positive Wassermann reaction (often weak) in 277 cases. Some history of previous general disease is noted in the great majority of cases. Dysentery, malarial and other fevers and influenza were the most common, in the order named. Other diseases mentioned are: tuberculosis, leprosy, rheumatism, gonorrhea, arteriosclerosis and helminthiasis.

While no column is devoted to diagnosis, the clinical features of the cases, especially the ophthalmoscopic symptoms, seem to indicate that in 103 cases there was some neuritis or papilledema, no attempt being made to distinguish between edema or passive congestion and active hyperemia or inflammation. Of optic atrophy, there were 174 cases, many of which showed evidence of earlier inflammation. In a small proportion of cases, the optic nerve condition seems to have been only a coincident of other more important deviations from the normal.

This collection of cases seems particularly valuable for certain statistical data, notably the frequency of the evidence or history of gonorrhea, and the conditions found by examinations of the blood, urine, the blood pressure and the Wassermann reaction. The records are most defective with regard to the fields of vision. Only in five cases was impairment of the field recorded, and in only 31 is the absence of any impairment mentioned. As of its companion pamphlet, it is to be hoped that this collection may be widely distributed in medical libraries.

E. J.

Endocrine Diseases, Including Their Diagnosis and Treatment, by Professor Wilhelm Falta, of Vienna. Translated and edited by Milton K. Meyers, M. D., of Philadelphia. Cloth, large 8 vo., 692 pages, 104 illustrations. Philadelphia, P. Blakiston's Son and Co.

Men, not yet old in medicine, can plead a very defective education in regard to the "ductless glands," as they were called less than a generation ago. But the extremely wide importance of the control they exert over nutrition, makes the physiology and pathology of the endocrins such important recent additions to medical science, that every member of the medical profession should become familiar with them, however restricted his line of practice.

In this field the contributions of animal experiment and clinical observation have been intimately intermingled, from the work of Kocher on the thyroid in dogs and men, to that of Bant-

ing on insulin. It is fortunate that this first general presentation of this subject comes from one who adds to the general practice of medicine a widely recognized mastery of pathologic chemistry.

The first chapter gives a general survey of the history of the subject, the embryology of the ductless glands, their physiology and mutual relations and influences on nutrition, and especially on the nervous system. Chapter II takes up the diseases of the thyroid gland, and Chapter III cretinism and goitre. The description and diseases of the parathyroid glands, including tetany, occupy Chapter IV. Chapter V takes up the diseases of the thymus gland. Chapter VI is devoted to the hypophysis, Chapter VII to the pineal gland, and Chapter VIII to diseases of the suprarenal apparatus. The headings of the other chapters are: IX Status Lymphaticus and Status Hypoplasticus; X Diseases of the Sexual Glands; XI Pluriglandular Diseases; XII Vegetative Disturbances That Do Not Depend Directly on Diseases of the Ductless Glands; XIII Diseases of the Insular Apparatus of the Pancreas and Diabetes; XIV Different Forms of Obesity and Adipositas Dolorosa.

The value of each chapter is increased by the "Addendum" that closes it. These are by the editor. To one of them we owe the only mention of "insulin." This gives in twenty lines a brief, practical statement of the facts thus far established. The same addendum also gives a practical discussion of diets for diabetes. In general the comments of the editor, which are scattered thruout the book, are enlightening and practical. They fully justify the association of his name with Professor Falta's in the authorship of the book.

For the ophthalmologist, the chapters having the greatest interest will be: Those dealing with the thyroid (exophthalmic goitre); the parathyroids (tetany and cataract); the hypophysis and acromegaly (chiasmal symptoms); the adrenals and diabetes. But nutrition is so profoundly influ-

enced by all endocrin conditions, and plays such a vital part in the course of many ocular diseases, that all parts of the book are found interesting and important. For the student, the clear language of the text and the bibliography appended to each chapter, add much to the value and interest.

E. J.

The Tonsil, by Harry A. Barnes, M. D. Second edition, cloth; 217 pages and 45 illustrations. Price \$5. Published by C. V. Mosby Co.

Since the first edition was published nine years ago, there have been improvements in technic for the removal of the tonsils, and at the present time, there is greater uniformity of opinion on the tonsils. The second edition has incorporated all that is new on the subject. The chapter on focal infection has been rewritten and discusses the relation of the tonsils to systemic infections.

The chapters on development, anatomy and diseases of the tonsil are fully illustrated with drawings and photomicrographs of normal and diseased tonsils and adenoids.

The indications for tonsillectomy are covered in the chapter on surgery of the tonsil. Selections of anesthetics and preparation of the patient precede the description of the surgical technic. The combined dissection and snare operation is given as the method of choice. It is described in detail and the steps of the operation are illustrated. The finger dissection and Sluder operation are described also.

The last chapter is devoted to the complications and sequela of operations on the tonsils; and the influence of the X-Ray and radium on tonsillar hypertrophy.

This book will be a valuable addition to the ophthalmologist's library, because it systematically covers the present status of the tonsil and its role in focal infection. To those who combine the specialties, the second edition will be found to contain a complete and conservative exposition of the subject.

W. C. F.

Tonsillectomy: Greenfield Sluder.

Cloth, 176 pages with 90 illustrations. Published by C. V. Mosby Company. St. Louis, Mo.

The chief object of the book is to present adequately the method of tonsillectomy by means of the alveolar eminence of the mandible and a guillotine—"The Sluder Method."

The first is a short chapter that covers the development of methods of tonsillectomy. Next, embryology, comparative anatomy and human anatomy of the tonsil and pharynx are discussed. The chapter on physiology and general pathology enumerates the various theories regarding the function of the tonsil, and treats of the different clinical types of tonsillar disease. Histopathology and bacteriology are given adequate space, and photomicrographs of sections of diseased tonsils illustrate this portion of the text.

A full chapter is devoted to the indications for tonsillectomy and prognosis.

The chapter on operations includes hospital preparation, choice of anesthetics, and selection of technic. A separate chapter deals with the technic of the Sluder operation. The various steps of the procedure are fully illustrated, and illustrations of modifications of the guillotine are shown.

The last chapter is on adenoidectomy with direct vision and is written by Dr. I. D. Kelley.

For those interested in the guillotine method for the removal of tonsils, this book will be found of great value.

W. C. F.

Applied Pathology in Diseases of Nose, Throat and Ear. Joseph C. Beck, M. D., F.A.C.S., with 268 original illustrations including 4 color plates. Published by C. V. Mosby Company, St. Louis. 1923.

As the author states in the Foreword, this is the first text in English limited to the pathology of nose, throat and ear diseases. The illustrations and descriptions of microscopic and gross pathology are highly instructive.

To the practicing ear, nose and throat specialist this book will be ex-

tremely valuable, because it includes the treatments used by Dr. Beck for the various diseases described.

This is the first text book written by a regular physician in which mention is made of diathermy and rapid sinusoidal current, in treatment of diseases of the ear. This gives a foretaste of what the new texts must include—namely a chapter on electrotherapy in diseases of ear, nose and throat.

This publication is worthy of a place in the library of every practicing otolaryngologist.

J. H. HARTER.

Contributions to the Study of Tuberculosis. Research Department, National Jewish Hospital for Consumptives. Volume IV, 1923. Paper, 302 pages, 6 plates and 45 illustrations, Denver, Colo.

This volume contains the report of the Research Director of the Hospital, Dr. H. J. Corper, three articles (58 pages) prepared for it, and reprints of nineteen papers that are published in seven different journals; one of them being the paper by Dr. W. C. Finnoff from this journal (v. 7, 1924, p. 81), with the colored plate accompanying it.

Some of these papers like "The Beginning of Physiological Research in America" by Dr. Henry Sewall; "The Evolution of Clinical Pathology" by Dr. Harry Gans, and "Adequate Laboratory Service in the Modern Hospital" by Ward Burdick, are of rather general interest. But most of them deal with tuberculosis and problems closely connected with it.

The chief importance of this volume lies in the evidence it gives of the possibilities of research work in America, and that the necessary support is given it by an institution belonging to the class of philanthropic undertakings that too often ignore the necessity for the scientific basis of public service, and make their appeal wholly to the sentimentalism from which they expect to draw their financial support. The scientific research work which makes such a good showing in this volume, should be emphasized and held up as an example of the most

far reaching and important work that can be done for humanity, the prevention of disease and untimely death, which deserves support much more than the simple relief of immediate individual suffering.

E. J.

BIOGRAPHIC SKETCH JOSE RIZAL Y MERCADO.

DR. A. R. UBALDO.

MANILA, P. I.

JOSE RIZAL Y MERCADO, the greatest Filipino patriot and the most revered of Filipino heroes, was born in the town of Calamba of the province of Laguna on June 19, 1861. Volumes have been written on his life and works. Among the best known are, those by W. Retana, a Spanish writer; that by Austin Craig, former Rizal research professor in the University of the Philippines, and that by Russell and Rodriguez.

He is known at home and abroad, not only as a patriot and a hero who died for his country, but also as a most versatile genius, who according to Russell and Rodriguez scarcely has a companion in human records. "He was a physician that had chosen diseases of the eye for his specialty, wherein he stood in a place of distinction before his profession. He was next an artist in sculpture and painting; a poet; a master of verse and nervous prose in Spanish, in his native Tagalog, and in ten other languages—English, French, German, Italian, Japanese, Greek and even Hebrew, Sanskrit, Arabic. He was next a scientist distinguished in original research, already honored with regard by leading European minds in many branches of recondite knowledge."

Rizal obtained his early education at home and in Biñan, a town near Calamba, and then in Manila where he took his A. B. degree with highest honor at the age of 15 in the Ateneo



Jose Rizal y Mercado, 1861-1896.

de Manila, a school conducted by the Jesuit Fathers. He then began the Medical course in Santo Tomas University. But shortly after he had to leave the islands because of the beginning of troubles which his family had with Spanish officials. That was a time of unrest and discontent in the Philippines, because of the ever-increasing abuses committed by the Spanish government. No wonder that the greater part of this great man's energy and thoughts was centered, as shown in his writings, in the sufferings and needs of reform in the Philippines under the heavy yoke of Spanish rule.

He finished his medical course in the Universidad Central de Madrid in 1885, there also obtaining honors. He also studied philosophy and literature in this University, and while outside he devoted his time to arts and modern languages. In 1886 he received the degree of Licentiate in Philosophy. He then visited the Universities of Leipzig, Heidelberg and Berlin. In 1887 he traveled in Austria, Switzerland and Italy. In April 1888 he went to the United States and from thence he proceeded to London, Paris, Belgium and Holland. In his travel he made the acquaintance and was honored by

the friendship of great men like Virchow, Jäger, Meyer, Blumentritt and others.

From Madrid he went to Paris and was chosen clinical assistant to Dr. L. de Wecker, one of the famous oculists of Europe. He had also worked with Galezowski in Paris and Schulzer in Heidelberg. He had a special liking for this branch of medicine and devoted much time to ophthalmic surgery. In Vienna he studied under Prof. Fuchs. In 1887 he returned to the Philippines, anxious to be of assistance to his mother after having received the news of her gradual failing of sight. In the same year he successfully performed in their house in Calamba the cataract extraction of her left eye, which restored her vision. This was the first operation of its kind done in the Philippines. News of his success spread rapidly thruout the Islands and neighboring countries, and this brought him into eminence and great practice. Patients came from all parts of the Islands and even from China.

During that year he also performed in Calamba an enucleation, two cases of correction of strabismus, and one removal of pterygium.

ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

Bulson, A. E. Jr. Cycloplegics in Refraction Work. Jour. Indiana State Med. Assoc., Vol. XVI, June 15, 1923, pp. 198-204.

In all patients under forty years of age, and even in most of them past that age, the examiner is never sure of the static refraction until after the accommodation has been paralyzed, and the only satisfactory way to paralyze the accommodation is by the use of cycloplegics.

Atropin is the best cycloplegic, one drop of a one percent solution being instilled three times a day for four or five days before the examination. Except in a few instances, a weaker cycloplegic is satisfactory.

Hyoscin in half percent solution is almost as satisfactory as atropin and the effect wears off in about one half the time required for atropin.

Homatropin in two percent solution is the most evanescent of any of the cycloplegics. It is satisfactory in a very large proportion of cases. A reliable, fresh solution should be used, not less than six times, at ten minute intervals. Cocain should not be added to the homatropin because it produces wrinkling and nebulous clouding of the epithelium of the cornea.

Retinoscopy should be carefully done at a measured distance from the eye.

Where any doubt about elevation of

tension in the eyes exists, test should be made. The author uses full six drops of homatropin in patients up to 50 years and one to four drops in all patients beyond 50 years. In these cases he always uses a myotic before the patient leaves the office. Homatropin is not very reliable in children and young adults.

L. P.

Canitano, S. Base Line and Interpupillary Distance in Correction of Refractive Errors. *Arch. di Ott.*, 1923, Vol. 30, p. 409.

The difficulty in many cases of obviating the prism effect produced by improperly centered lenses is emphasized. It is, in fact, true that lenses can be properly centered only for one given degree of convergence, other amounts of convergence always bringing in a certain prismatic effect which causes muscle strain. For this reason it is especially important that the centering for distant vision shall be as accurate as possible so that the errors in centering occurring in other positions of regard will be as small as possible. The difference between the base line, which is the distance between the optical centers of the two eyes, and the interpupillary distance is brought out.

Besides the common sources of error such as eccentrically placed pupils, and anisocoria, even in normal eyes it is only rarely that the base line corresponds with the interpupillary distance. In 123 cases, some normal, some showing refractive errors, but otherwise no abnormality, these measurements were made using Polack's ophthalmostatometer. In all cases there was some difference between the pupillary distance and the base line, differences from 2.3 to 7 mm. The difference was more marked in hyperopia and hyperopic astigmatism, in which the pupillary distance was less than the base line. In myopia and myopic astigmatism, on the other hand, there was less difference between the two measurements, and the pupillary distance was usually greater than the base line. Thus the pupillary distance as ordinarily measured cannot be properly

used as the basis for centering lenses to avoid prismatic effect. The base line is the proper measurements for this purpose and if it is used the errors in centering will be minimal.

S. R. G.

Richards, W. M., and Penel, R. Treatment of Overuse of Eyes by Exact Correction of Ametropia. *Ann. d'Ocul.* 1923, V. 160, pp. 545-561.

If the glasses are to be satisfactory, the following conditions must be fulfilled: (1) Examination under mydriasis or cycloplegia; (2) the use of one eighth of a diopter; (3) a good routine of examination; (4) subtraction from the amount found under cycloplegia; (5) verification of the prescription; (6) adjustment of the frames by the oculist himself, and the use of the glasses under his supervision. The authors' method of examination is described, emphasizing the use of the cross cylinder. The eyes are always tested postcycloplegic, and certain subtractions are made according to the formulae laid down by Gould. They make the categorical statement that the cylinder found under cycloplegia should never be changed under postcycloplegia. If the axis varies, it is better to use the one found under cycloplegia.

C. L.

Gaudissart, P. Phantasies of Hysteric Amblyopia. *Ann. d'Ocul.* 1923, Vol. 160, pp. 380-384.

Two cases of hysteric amblyopia are reported. In the first, there was rapid loss of vision, accompanied by photophobia and loss of sensitiveness of the bulbar conjunctiva. Vision with both eyes together was always better than with either eye separately, except when either eye was occluded without the patient's knowledge, in which case the vision of the other eye was equal to the best vision of both together. The accommodation was apparently completely paralyzed for reading, but the patient was able to overcome a concave lens of 2.5 D. Even with a convex lens of 3. D, the patient was unable to read. By reeducation, ability to read returned, but prolonged reading is still impossible.

The second case complained of gradual loss of vision, photophobia and lacrimation. No lesions anywhere. The visual fields showed a considerable, irregular, concentric contraction, with an absolute central scotoma, the limits of which were concentric with the peripheral contraction. With plano lenses the vision was $2/3$, falling to $1/8$ when these lenses were removed. Periods of exacerbation and remission of all symptoms occurred.

C. L.

Hauptvogel, J. Ribbon Shaped Opacity of the Cornea. *Klin. M. f. Augenh.* 1922, Vol. 69, p. 763.

Hauptvogel describes a case of primary, ribbon shaped opacity of the right cornea of a girl aged 20, which developed at the age of 14. It consisted of a greyish white, slightly curved band, from 3 to 5 mm. wide, and contained minute white granules and needles in Bowman's membrane below the epithelium, leaving a very small zone of clear cornea free at the limbus. Independent of this was a second opaque layer in Decemet's membrane. V. $2/60$; with -3 . D. Sph. $6/24$. Some parts of the opacity showed diminished, others increased, sensibility, which corresponded to the sensitiveness of the eyeball to pressure.

Then thirteen cases of secondary ribbon shaped opacity with preserved vision are briefly reported. With regard to etiology the author rejects traumatic influences, or evaporation of the nutritive fluid of the cornea, and adopts Elschnig's view, which attributes an important part to the action of light on the albumin of the cornea, if there is a predisposition to sedimentation of calcium salts, e.g. in old people from absorption of bone substance. C. Z.

Barczinski, S. Injury of the Eye by the Sting of a Bee. *Klin. M. f. Augenh.* 1922, Vol. 69, p. 769.

Clinical and experimental observations proved that the poison of bees causes an inflammation, with necrosis and subsequent proliferation of various tissues. In Barczinski's case of a man aged 18, the right cornea was

stung by a bee four days previously. The whole cornea showed parenchymatous opacity and a small yellowish foreign body, the point of the prick which was extracted. Maximal mydriasis existed due to paralysis of the sphincter by the poison. Only after eight weeks an internal ulcer developed on Decemet's membrane, and finally yellowish nodules at the extreme angle of the anterior chamber. The mydriasis remained unaltered. The nodules grew smaller and became more whitish. V. fingers at 2 m. after two months. C. Z.

Lister, Sir William. Holes in the Retina and Their Clinical Significance. *Brit. J. Ophth.*, v. 8, 1924, p. 1.

The author divides his subject under three headings; clinical varieties, etiology and clinical significance. Clinical varieties are macular and peripheral; either may be traumatic or nontraumatic. Traumatic macular holes may be single or several. They present a punched out appearance—bright red center with white periphery. Nontraumatic probably result from retinochoroidal degeneration. Traumatic peripheral holes are slit like, horseshoe shaped, or oval rents, situated in detached retina. Nontraumatic are associated with choroiditis or contraction of the vitreous.

Etiology: Not in every case of detachment of the retina is a hole discovered. If, after fixation, a solid coagulum is found in the interretinal space, there cannot be a hole. Where the interretinal fluid is of similar consistency to the vitreous, and no hole is found, it is either obscured by a retinal fold, or the breaking up of the interretinal fluid into more readily diffusible substances.

Traumatic macular holes actually occur; but whether they result from the blow, or cystic degeneration as the result of the blow, is uncertain. Peripheral traumatic holes may occur at the site of impact or in protected parts due to distension.

Nontraumatic holes; cystic degeneration is a likely cause. The author discusses Raehlman's osmotic diffusion theory, Elschnig's theory of detachment, with a pegging out of the retina to the choroid by preexisting areas of retino-

choroiditis, and Leber and Nordenson's theory of traction by fibrous bands in the vitreous.

Under clinical significance, an important fact is Leber's observation that sudden detachment of the retina cannot occur without a hole. With an intact eyeball and an intact retina, no detachment can take place; unless there is an outpouring of fluid into the interretinal space on the one hand, and contraction of the vitreous on the other. Detachment without a hole must be gradual, whereas, if a hole is present, it is sudden.

So far as the author is aware, no cases of detachment of the retina due to neoplasm, when examined pathologically have been found associated with a hole in the retina. If this is true, it is an important clue in differential diagnosis. Accurate history of sudden loss of sight from detachment, or the detection of a hole, excludes the presence of a growth. Etiologically, the detached retina is either dragged in by a shrinking vitreous, pushed in by fluid in the interretinal space, or floated in by transposition of the vitreous thru a retinal hole.

Where no hole is present, apart from cases of neoplasm, treatment may afford success. Where holes can be detected, treatment is not favorable, yet, there are certain exceptions. Thus, macular holes and certain peripheral holes are not accompanied with detachment. As to whether treatment of cases of detachment with holes should be undertaken or not, will require increased knowledge of the causation of holes, improved clinical methods of detecting whether the retina is pushed or dragged in and a larger number of reports of practical experience of surgeons.

Thirteen microphotographic reproductions and two colored plates accompany the contribution.

D. F. H.

H. C. Neblett. Retinal Detachment in a Pilot of the Air Service. Military Surgeon, December, 1923.

A muscular and well developed individual, twenty-four years of age, had served four and one-half years in the army, the last three years of which he served as a pilot in the air service.

Family history and past history negative for any factors that may have had bearing on the eye condition. The pilot stated that during his period of service all of the many examinations of his eyes had been negative prior to September, 1919, and prior to that time he had not experienced any trouble with either eye. He always wore goggles while flying, had never suffered an injury to his head or eyes, and had never worn glasses.

In September, 1919, while piloting an airplane at an altitude of 8,000 feet, and preparatory to landing, he fell into a series of "tail-spins," rapidly losing altitude, to within 1,500 feet of the ground. At the latter height he suffered a severe pain in the right side of the head and the right eye, which was immediately followed by photophobia and blurring of vision in both eyes. These symptoms were so severe it became necessary for him to remain in the air for about fifteen minutes before his vision had cleared sufficiently for him to attempt to land his plane. Very soon after landing the left eye became normal, but the symptoms in the right eye continued without appreciable relief until after a period of about ten days' treatment.

Following this no further trouble was experienced with the eyes except that the right would become very easily tired while reading or while flying over a moderately protracted period of time. About six months later the above symptoms in the affected eye were more pronounced and, in addition, there was some dimness of vision and flashes of light before the eye. These symptoms continued with slight remission until July, 1920, at which time he was given the prescribed examination for pilots and was temporarily disqualified for flying status on account of diminished visual acuity in the right eye with less than one degree of hyperphoria present.

After one month's treatment and rest he was reexamined and qualified for flying duty, a waiver being given for the affected eye. From that time no further increase in symptoms in the

eye were noted until December, 1920. While piloting a plane and landing "into the sun" he again suffered pain and blurring of vision in the right eye. Treatment was again effectual in relieving the pain and somewhat improving the vision. Following this no material change was noted in the right eye until March 10, 1921, during a cross-country flight of about five hours' duration at an average altitude of 6,000 feet. During the latter part of this flight, pain, photophobia and dimness of vision were quite marked in the right eye. Rest and treatment again resulted in a partial relief of all symptoms.

On July 21, 1921, pilot's plane was wrecked in a crash at sea in which he suffered a very severe fall, but without definitely localized injury. This was immediately followed by a rather severe recurrence of all previous eye symptoms. Examination of the pilot resulted in disqualification for flying duty on account of defective vision in the right eye. For a period of three weeks from that date he was under observation and treatment, and on August 17, 1921, was again examined with no material improvement evident in the eye. Rest and treatment of the eye was resumed, and on September 5, 1921, he was again examined and the eye was found to have sufficiently improved to barely come within the limits of the waiver permitting a resumption of flying status. During the first week of November, 1921, following a cross-country flight of 300 miles, he again had trouble in the right eye. Of further interest in this case was the unusually large number of crashes and poor landings, made by this pilot during his period of service.

The writer's attention was first attracted to this pilot on November 20, 1921, while he was making practice landings in a single seated plane. It was noticed that in making two at-

tempts to land he showed a marked error in judgment in "levelling off" and at the same time allowed the left wing of the plane to dip considerably. His third attempt to land his plane resulted in demolishing it by striking the ground heavily on the left wheel and wing. There was no injury sustained by him. Immediately following the accident he was given a careful examination, special care being taken in examination of the eyes. The left was normal. The right showed markedly diminished visual acuity to the usual tests for flying and for ordinary vision. In addition, there was considerable narrowing of the supraorbital and temporal fields of vision. An examination of the eyeground revealed an almost complete detachment of the retina from below. The detachment was seen as grayish ribbon like folds with a loss of the light reflex of the blood vessels at various points. The diagnosis was confirmed by two other medical officers, one an ophthalmologist. The diagnosis was later confirmed at a general hospital to which the case was immediately transferred. Treatment at the latter place for three months was without beneficial results, and the pilot was retired from the service on account of practically total blindness in the affected eye.

In so far as flight surgeons are concerned in the examination and care of pilots, it seems that this case points out the necessity for a very thorough examination of the eyes in the case of any pilot, who previously had normal vision, but who, following a crash or from any unusual circumstances connected with his vocation, complains of or shows a diminution of acuity of vision in either eye, with or without flashes of light before the eye, blurring of vision or photophobia. He should be looked upon with suspicion of beginning retinal detachment.

H. V. W.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. George H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph L. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn.; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. Edward D. LeCompte, Salt Lake City.

DEATHS.

Prof. Jan Deyl of Prague, age sixty-nine, died recently at his home.

Dr. Horace Bonner, Dayton, Ohio, age seventy-three, died April fifteenth, of cerebral hemorrhage.

Dr. Harry Rodman, New York, age fifty-two, died April twenty-nine, following a cholecystotomy.

Dr. Henry R. Price, Brooklyn, age seventy-four, died April seventeenth, at the Johns Hopkins Hospital, Baltimore, of senility.

Dr. George Weeks Hale, Nashville, Tennessee, age seventy-six, was found dead in his bed April twenty-eight, of heart disease.

We regret to announce the death of Dr. José A. Barraquer, emeritus professor of ophthalmology at the University of Barcelona.

Dr. R. T. Merrill, age fifty-one, ophthalmologist of Logan, Utah, died December seventeenth, 1923.

George Henry Oliver, consulting ophthalmic surgeon, Bradford Royal Eye and Ear Hospital, died April 4, 1924, aged 63 years.

PERSONAL.

Dr. J. F. Crouch of Baltimore has sailed for Germany for a two months' vacation.

Dr. H. C. Fleck of Baltimore has recently returned from a trip to Cuba.

Dr. A. J. Ridges, of Salt Lake City, is doing postgraduate work in Germany.

Dr. Hugo Aufmwasser of Covington Ky., has sailed for Europe to be gone until September.

Dr. J. F. Fulton, St. Paul, Minnesota, planned to sail from Montreal for England, May twentieth, 1924.

Dr. A. G. Hovde, who recently returned from California, has again resumed his practice in Superior, Wisconsin.

Dr. James W. Smith has been appointed assistant attending ophthalmologist to the New York City Hospital.

Dr. D. L. Tilderquist, Duluth, Minnesota, sailed for Europe May fifth, 1924. He expects to do postgraduate work in Vienna.

Dr. Frederick H. Verhoeff, of Boston, has been appointed Professor of Ophthalmic Research in Harvard University.

Dr. S. Lewis Ziegler and Dr. Paul J. Sartin of Philadelphia expect to spend the coming summer abroad.

Dr. Joseph O. Stillson has resumed his office in the Medical Arts Building, Indianapolis.

Dr. A. E. Bulson addressed the Elkhart County Medical Society on "The Making of a Physician," April third.

Dr. and Mrs. Fred Stauffer of Salt Lake City have lately returned from a winter cruise of the Mediterranean and travel in Europe.

Dr. Eugene Bulson, son of Dr. A. E. Bulson, has returned to Ft. Wayne after doing postgraduate work at Harvard Medical School.

Dr. Joseph A. Andrews of Santa Barbara, California, left for Labrador, May twenty-fifth, where he expects to remain until November, 1924.

Dr. McCluney Radcliffe of Philadelphia is planning to spend the summer months with his family at his cottage in Ocean City, New Jersey.

Dr. C. A. Clapp was elected chairman of the Ophthalmological Section of the Baltimore City Medical Society at its recent meeting, and Dr. Jonas Friedenwald, secretary.

Dr. C. A. Broadbuss, associated with the United States Veterans' Bureau in Salt Lake City, will take up his practice on June first in Stockton, California.

Dr. and Mrs. Wm. M. Sweet of Philadelphia are planning to spend a portion of their summer in Vienna and later will enjoy a motor trip in Southern France including the Pyrenees.

The many professional friends of Professor E. Fuchs of Vienna will be glad to learn that Dr. Ring, of Philadelphia, has recently received word from him in Cairo, where he has been spending the winter, and that he continues in good health.

Dr. George E. deSchweinitz of Philadelphia has retired as Professor of Ophthalmology of the Medical Department of the University of Pennsylvania to which chair he has given outstanding distinction for many years.

Dr. Edward Jackson of Denver has been visiting the Northwest and addressed the Puget Sound Academy of Ophthalmology and Oto-Laryngology on the subject of "Postgraduate Medical Instruction" at a meeting held in Seattle May twentieth.

Dr. E. B. Demaria has been commissioned by the Argentine Public Health Service to

collect statistics and other data on the prevalence of trachoma and other diseases of the eyes in Argentina. The local officials have been ordered to cooperate with him in his trip thru the country.

Dr. William Zentmayer of Philadelphia, after attending the meeting of the Ophthalmic Section of the American Medical Association, and the American Ophthalmological Society will spend the summer abroad, visiting mainly Zurich, Jena and Vienna.

Dr. and Mrs. John E. Weeks of New York have returned to America, arriving in Seattle May twenty-third, and have gone to Portland, Oregon, for several weeks. Dr. Weeks addressed the Rockefeller Foundations in several cities of Asia, notably the Imperial Medical University at Peking, China, the Burma School at Madras, India, and in other countries.

Dr. Edward A. Shumway of Philadelphia, Associate Professor of Ophthalmology in the University of Pennsylvania, who has been associated with Dr. deSchweinitz for over twenty-two years in the work of the University Clinic, has resigned. The Ophthalmic profession has long recognized Dr. Shumway's especial distinction in Ocular Pathology and regrets his voluntary removal from the ranks of our distinguished teachers.

Dr. George E. deSchweinitz of Philadelphia was the guest of honor at the annual meeting of the Société Française d'Ophthalmologie held in Paris, May twelfth. The subject of his contribution to the program was: "Concerning Certain Ocular Interpretations of Focal Infections, Exclusive of Those Types which are Commonly Attributed to this Etiological Factor, Being a Clinical Communication." Following the above meeting, Dr. de Schweinitz went to Brussels where he read a paper before the Société Belge d'Ophthalmologie, his special theme being "The Relation of Pressure by Tense Bloodvessels on the Basal Visual Pathways to Defects in the Fields of Vision."

SOCIETIES.

At the annual meeting of the National Committee for the Prevention of Blindness, the following officers were elected for the ensuing year: President, Hon. William Fellowes Morgan, New York; vice-president, Dr. F. Park Lewis, Buffalo, New York, and secretary, Miss Winifred Hathaway, New York.

The twenty-ninth annual meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in Montreal, Canada, September 16-20, under the presidency of Dr. Walter B. Lancaster, Boston. Lieut-Col. Henry Kirkpatrick, of London and India, the guest of honor, will give an address on "Cataract."

At a recent meeting of the Minnesota Academy of Ophthalmology, held at St. Paul, the following officers were elected: President, Dr. J. S. MacNie, Minneapolis, Minnesota; Vice-president, H. P. Wagener, Rochester, Minnesota; Second Vice-president, T. J. Maloney, St. Paul, Minnesota; Secretary, J. H. Morse, Minneapolis, Minnesota. Dr. W. E.

Camp, Minneapolis, read a very interesting paper upon the "Pathology of the Middle Ear."

The Virginia Society of Oto-Laryngology and Ophthalmology met at Lynchburg on April 30, 1924, under the presidency of Dr. Jos. A. White of Richmond. The invited guests were: Dr. Ross Skillern of Philadelphia, who gave a demonstration of surgery of the nasal sinuses, and Dr. Harry Friedenwald of Baltimore, who spoke on hemorrhagic diseases in the retina and choroid in young persons. Dr. Jas. Morrison of Lynchburg was elected President; Dr. H. S. Hedges of Charlottesville, Vice-president; Dr. E. U. Wallerstein of Richmond, Secretary-Treasurer; Dr. Joseph A. White of Richmond, Councilor. The Society will meet next year in Winchester, Va.

Archeologists excavating on the site of ancient Carthage have found, among other things, a pair of spectacles claimed to be of the third century B. C.

MISCELLANEOUS.

There are now one hundred and eighty sight conservation classes in the public schools of the United States. New York City has the largest number of classes—fifty.

Under the will of the late Dr. David Webster, his portrait by Waltman was given to the Manhattan Eye, Ear and Throat Hospital.

The city code of Chicago has been amended to provide fines of from ten to one hundred dollars for physicians or midwives who neglect, or improperly treat new-born infants' eyes.

In 1910 there were recorded 20,915 cases of trachoma in the public schools of New York City; in 1920 the number had been reduced to 944; in 1922 there were 345 cases, all under treatment.

A special course of training to prepare teachers of Sight Conservation Classes, will be given at the summer session of Peabody College, Nashville, Tennessee. The course will be opened June ninth and continue for six weeks.

A second study is being initiated by the American Social Hygiene Association and the National Committee for the Prevention of Blindness, to ascertain the relationship between venereal diseases and eye diseases.

Under the will of Mrs. Sarah J. Robinson of New York, the Society for the Relief of the Destitute Blind and the New York Association for the Blind were each beneficiary to the extent of \$106,683.

A new section has been added to the New York state education law, which requires the commissioner of education to appoint a specialist to assist the state medical inspector in making eye and ear tests in public school pupils.

The first annual "Save Your Sight Day" was held in St. Louis, May fourteenth, under the auspices of the Missouri Association for the Blind. Seven free clinics were given by members of the ophthalmic section of the St. Louis Medical Society.

The National Committee for the Prevention of Blindness is undertaking, in cooperation with a number of other organizations, a study of eye examinations of school children, with a view to standardizing methods of making examinations and methods of recording them.

The April number of the *Quarterly Journal of Medicine* contains a paper by Mr. William Stobie on "The Association of Blue Sclerotics with Brittle Bones and Progressive Deafness." Of a family of sixty-six, eighteen displayed blue sclerotics, and of this number eight suffered from fractures and eight from deafness.

The bill introduced into the Kentucky State Legislature authorizing the establishment of Sight Saving Classes in the public schools was passed unanimously by both houses. The prime mover in this important measure was Miss Linda Neville, often called the "Messenger of Light of Kentucky," because of her untiring efforts to save sight.

Twenty-nine thousand out of sixty thousand Ford workers have defective vision, according to a report made by the Ford management to the Eyesight Conservation Council of America. The company first started to make these tests in 1912. At the solicitation of the Hoover committee of the Federated American Engineering societies, a general survey is being made of eyesight conditions among the nation's industries.

Only 4,227,702 of the 24,000,000 school children in the United States received eye tests in 1923, according to a preliminary report issued by the Eye Sight Conservation Council of America, embodying the initial findings of a nation wide survey of eye conservation in education and industry.

Plans are nearing completion for the new trachoma hospital to be erected at the United States Veterans Bureau Hospital, Pikeville, Kentucky. The hospital, which is the first of its kind to be built in the United States, will contain sixty beds. It will be used exclusively by trachoma patients, and will have special fittings to enable patients to feel their way by foot. As far as it is possible, nothing will be touched with the hands. It will also have a research laboratory for specialists in trachoma and other eye diseases.

Baltimore and Chicago report no cases of blindness from ophthalmia neonatorum during the year. Massachusetts reports no case of blindness from this cause for five years; Nashville, for eleven years. Grand Rapids reports that there is no blind child of school age in the city. Cleveland reports that there is no blind child under three years of age in the city. Altho the population of Cleveland has doubled within the last twelve years the blind population has remained stationary. New Jersey was unable to find five blind children in the community—the number necessary

to form a class for the blind in a public school.

Dr. A. Fuchs' itinerary after he leaves China for the United States is as follows:

Due at Victoria, August 5; Seattle (guest of Dr. Bell), August 7; San Francisco (guest of Dr. H. Barkan), August 9-31; St. Louis (guest of Dr. Keller), Sept. 10; Chicago, September 15; New York (guest of Dr. Robert G. Reese), September 20 to October 14.

There are now five vacancies in the Chicago unit of the Medical Corps of the Illinois National Guard. Ex-service officers will be given preference for these commissions. It should be recalled that officers and men of federalized units draw pay thruout the year. Anyone interested can communicate with Col. Harry D. Orr, 5 South Wabash Ave., Suite 2010, Chicago, Ill.

For a number of years the Department of Health has been supplying midwives with silver nitrat solution, to be used in the prevention of ophthalmia neonatorum. The solution has been put up in wax capsules, two in each container. That the provision of the Sanitary Code requiring this work on the part of midwives is efficient is proved by the fact, that during the past few years very few cases of this dread disease have been reported in the practice of midwives—there having been only 6 in 1922, and 2 in 1923.

Recently, an improvement has been made in both the wax capsule holding the silver nitrat solution and in the container itself. The capsule, as now made, is lined with paraffin so as to prevent any precipitation of the silver salt. The box container has been changed from a round wooden one to a flat tin package. In each such box, as distributed to the midwives, are two wax capsules, containing about ten minims of a one per cent solution of silver nitrat, a needle with which to puncture the capsule, and simple directions for its use.—*Weekly Bull. Dept. of Health, N. Y., May 24, 1924.*

An English translation of the third German edition of H. von Helmholtz's *Treatise on Physiological Optics*, edited by James P. C. Southall, Professor of Physics in Columbia University, and published by the Optical Society of America, will be published in three volumes, approximately in the same style as the original German edition, with the same illustrations, plates, etc. It is hoped that the first volume will be ready for distribution by June 1924; and the other volumes will follow as soon as they can be prepared. The edition is limited to one thousand copies. The price will not exceed \$7 a volume. In order to insure getting all three volumes, orders should be sent without delay to F. K. Richtmyer, Managing Editor, Rockefeller Hall, Ithaca, N. Y.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-faced type**. The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col Pl.) colored plates. **Abst.** shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to American Journal of Ophthalmology, 217 Imperial Building, Denver, Colorado.

BOOKS.

Bailliant, P. La circulation rétinienne, a l'état normal et pathologique 403 pages, 57 illustrations, Paris, 1923. J. A. M. A., 1924, v. 82, p. 1463.

Deek, J. Applied pathology in diseases of nose, throat and ear. 280 pages, 268 illustrations, 4 plates in color. St. Louis, C. V. Mosby, 1923. A. J. O., 1924, v. 7, p. 405.

Fuchs, A. Atlas der histopathologie des Auges. 144 pages 44 colored plates, Leipzig and Vienna, F. Deuticke, 1923. A. J. O., 1924, v. 7, p. 402.

Lagrange, H. La tuberculose du tractus uveal; infection et superinfection, anatomie, pathologie et pathogenie. 8vo., 192 pages, 29 illustrations, 14 colored plates. Paris, G. Doin, 1924. Presse Méd., 1924, April 26, p. 711.

Practical Medicine Series. Eye, Ear, Nose and Throat. 1923, Chicago, Year Book Publishers. A. J. O., 1924, v. 7, p. 403.

Pratt, F. J. and Pratt, J. A. Intranasal surgery. 350 pages, 195 illustrations, Philadelphia, F. A. Davis and Co., 1924. A. J. O., 1924, v. 7, p. 404.

Spicer, W. T. H. Parenchymatous keratitis, interstitial keratitis, uveitis anterior. 8vo., 64 pages, 41 illustrations, London, Geo. Pullman and Sons, 1924. A. J. O., 1924, v. 7, p. 401.

DIAGNOSIS.

Assen, v. and Weve, H. Roentgenology of sella turcica. Arch. f. Augenh., 1924, v. 94, pp. 79-94.

Butler, T. H. Practical value of slit lamp. (dis.) Royal Soc. Med., Sec. on Ophth., 1924, Jan. A. J. O., 1924, v. 7, pp. 378-382. Visibility of actual blood stream with ordinary loupe. Arch. of Ophth., 1924, v. 53, pp. 267-271.

Ellett, E. C. Value of photographs in case records. A. J. O., 1924, v. 7, p. 396.

Gifford, S. R. Slit lamp work at Zurich. A. J. O., 1924, v. 7, p. 389.

Jackson, E. Laboratory and clinical instruments. A. J. O., 1924, v. 7, pp. 399-400.

Schieck. Technik und result of slit lamp examination of eye. La Med. Germano-Hisp.-Amer., No. 5. Abst. Deut. med. Woch., 1924, March 7, p. 321.

Snyder, W. H. Clinical use of slit lamp. A. J. O., 1924, v. 7, pp. 389-392.

Wurdemann, H. V. Academic instruments as aids to therapeutics. A. J. O., 1924, v. 7, p. 398.

THERAPEUTICS.

Birch-Hirschfeld. X-ray and radium therapy for malignant tumors in ophthalmology. Deut. med. Woch., 1924, March, pp. 401-403.

Danis. Retroocular injections of alcohol. (dis.) Bull. Soc. Belge d'Opht., 1923, v. 48, pp. 87-92.

Insulin in ophthalmology. Arch. de Oft., Hisp.-Amer., 1924, v. 24, p. 166.

Newman, R. H. Milk injection in inflammatory eye diseases. Trans. Tennessee State Med. Assn., 1924, April. Abst. J. A. M. A., 1924, v. 82, p. 1389.

Poyales. Insulin in ophthalmology. (bibl.) Arch. d'Opht., 1924, v. 41, pp. 207-216.

Seto, T. v. Experimental research of eel blood serum on eye. (bibl.) Graefe's Arch. f. Ophth., 1924, v. 113, pp. 103-114.

Experimental use of urotropin in ophthalmology. (bibl.) Graefe's Arch. f. Ophth., 1924, v. 113, pp. 126-133.

Treatment of ocular infections by proteins or nonspecific agents. Atlantic Med. Jour., 1924, v. 27, p. 522.

Repeated title. **Keegan, J.** (A. J. O., 1924, v. 7, p. 72) A. J. O., 1924, v. 7, p. 409.

PHYSIOLOGIC OPTICS.

Pikler, J. v. Vision of one-eyed. (3 pl. bibl.) Arch. f. Augenh., 1924, v. 94, pp. 104-113.

Weekers, L. Light sense, form sense and color sense. Arch. d'Opht., 1921, August. Abst. Brit. Jour. Ophth., 1924, v. 8, p. 245.

REFRACTION.

Black, M. Twins with high hyperopia. A. J. O., 1924, v. 7, p. 375.

Downey. Visual test. A. J. O., 1924, v. 7, p. 396.

Kieczkowski, F. Research in astigmatism of eye. (3 ills. bibl.) Clin. Opht., 1924, v. 28, pp. 130-138.

Percival, A. S. Prescribing spectacles. Brit. Jour. Ophth., 1924, v. 8, pp. 229-232.

OCULAR MOVEMENTS.

Agatston, S. A. Muscle retroplacement for squint. Simplified technic. A. J. O., 1924, v. 7, pp. 361-364.

Aloin, H. Tuberculous osteitis of petrosal bone with total paralysis of external ocular muscle and trigeminus. Soc. d'Opht. de Lyon, 1924, Feb. Abst. Clin. Opht., 1924, v. 28, p. 171.

Bertein and Rouquier. Convergence in postencephalitic Parkinson disease. Soc. d'Opht. de Lyon, 1924, Feb. Abst. Clin. Opht., 1924, v. 28, p. 174.

- Bollack.** Syndrome of inferior part of protruberant skull with paralysis of lateral movements of eyes. (1 ill.) *Revue Neurol.*, 1924, v. 31, pp. 336-341. *Abst. Presse Méd.*, 1924, April 26, p. 373.
- Borries, G. V. T.** Reflex nystagmus. *Monats. f. Ohrenh. u. Laryngo-Rhinol.*, 1923, v. 57, p. 547. *Abst. Klin. Woch.*, 1924, April 15, p. 695.
- Fischer, E.** Regional neutralization in post-operative binocular triptopia in strabismus. (bibl.) *Ann. d'Ocul.*, 1924, v. 161, pp. 208-212.
- Fischer, F. P. v.** Head movement and vision. *Graefe's Arch. f. Ophth.*, 1924, v. 113, p. 394-416.
- Gaillard and Pitre.** Paralysis of oculomotor muscle common in suppurative otitis of middle ear. *Soc. d'Ophth. de Lyon*, 1924, Jan. *Abst. Clin. Ophth.*, 1924, v. 28, p. 176.
- Galant, S. v.** Intoxication and nystagmus. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 392-393.
- Gonzalez, J. de J.** Pathogenesis of intrinsic ocular paralysis during convalescence from acute infectious diseases. *A. J. O.*, 1924, v. 7, pp. 351-353.
- Kearney, J. A.** Operation for cross eyed. *Arch. of Ophth.*, 1924, v. 53, pp. 274-279.
- Kunz, v. and Ohm, J.** Brain mechanism in nystagmus. (12 figs. 3 tables.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 41-67.
- Manolesco and Grigoresco.** Ocular paralysis after spinal anesthesia. *Soc. Roumaine d'Ophth. de Bucarest*, 1923, March. *Abst. Ann. d'Ocul.*, 1924, v. 161, p. 214.
- Natale, A.** Congenital defect of external rectus muscles. *Rev. de la Asoc. Med. Argentina*, 1923, v. 36, p. 789.
- Ohm, J. v.** Comparison of music and miners' nystagmus. (52 ills.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 68-102.
- Ohm.** Rotatory optical nystagmus and diseases of eye in general. (5 charts.) *Los Prog. d. l. Clin.*, 1924, v. 27, pp. 391-402.
- Peter, L. C.** Nonsurgical management of squint. *Trans. Tennessee State Med. Assn.*, 1924, April. *Abst. J. A. M. A.*, 1924, v. 82, p. 1388.
- Rawson, D. and Adrogué, E.** Congenital nystagmus with artificially provoked auricular lesions. *Semana Med.*, 1924, March 27, p. 567.
- Runge, W.** Eye muscle disturbance from alcohol. *Deut. med. Woch.*, 1924, March 7, pp. 298-300.
- Seligstein, M. B.** Divergent squint. *A. J. O.*, 1924, v. 7, p. 396.
- Toussaint.** Traumatic paralysis of left large oblique. *Arch. Méd. Belges*, 1924, Jan. *Abst. Clin. Ophth.*, 1924, v. 28, p. 163. *Abst. Brit. Med. Jour.*, 1924, March 29, *Cur. Med. lit.*, p. 47.
- Wodak, E. and Fischer, M. H.** Analysis of vestibular affections. *Med. Klin.*, 1924, Feb. 3, p. 164.
- Repeated title. **Brusselmans.** (*A. J. O.*, 1924, v. 7, p. 415) *Intern. Sur. Ophth.*, 1924, v. 7, p. 122.

CONJUNCTIVA.

- Gradaille.** Trachoma in Corunna. *Arch. de Oft. Hisp.-Amer.*, 1924, v. 24, pp. 135-137.
- Harry, F. v.** Gonorrheal keratoconjunctivitis. *Dermat. Zeit.*, 1923, v. 39, p. 137. *Abst. Klin. Woch.*, 1924, April 1, p. 598.
- Humblet.** Dissolution of cornea in trachoma with persistent transparency and absence of pain. (dis.) *Bull. Soc. Belge d'Ophth.*, 1923, v. 48, pp. 17-18.
- Johnson, G. T.** Dr. Worrell on jequirity for trachoma. *A. J. O.*, 1924, v. 7, p. 406.
- Li, T. M.** Trachoma in China. *Natl. Med. Jour. of China*, 1922, v. 8, No. 1. *Abst. Tropical Dis. Bull.*, 1923, v. 20, p. 981. Early diagnosis of trachoma. *Natl. Med. Jour. of China*, v. 10, p. 1.
- Lindner.** Inclusion bodies of trachoma. *Wiener ophth. Ges.*, 1924, Jan. *Abst. Wiener klin. Woch.*, 1924, Feb. 14, p. 177.
- Lobel.** Treatment of trachoma by method of Abadie. *Ann. d'Ocul.*, 1924, v. 161, p. 215.
- Stuckey, E. J.** Diagnosis of trachoma in Chinese. *China Med. Jour.*, 1924, v. 38, p. 182.
- Van Lint.** Conjunctival ligature. (1 ill. dis.) *Bull. Soc. Belge d'Ophth.*, 1923, v. 48, pp. 69-71.
- Zapatero, P.** Prophylaxis of trachoma. *Arch. de Oft. Hisp.-Amer.*, 1924, v. 24, pp. 129-134.
- Repeated titles. **Nicati.** (*A. J. O.*, 1924, v. 7, p. 332) *Med. Jour. and Record*, 1924, v. 119, p. 429. **Schall.** *A. J. O.*, 1923, v. 6, p. 535.) *A. J. O.*, 1924, v. 7, p. 409.

CORNEA AND SCLERA.

- Adrogué, E. and Lagos, E. J. J.** Xerosis of cornea. *Rev. de la Asoc. Med. Argentina*, 1923, v. 36, p. 839.
- Baldassare.** Paracentesis for cure of hypopyon keratitis. *Bull. d'Ocul.*, 1923, Oct. *Abst. Clin. Ophth.*, 1924, v. 28, p. 147.
- Bastai, P. and Busacca, A.** Pathogenesis of herpes febrilis. *Klin. Woch.*, 1924, Jan. 22, pp. 147-149.
- Kant, F. and Hahn, H.** Relation of Frey pain theory to sensibility of cornea and conjunctiva. *Klin. Woch.*, 1924, Jan., pp. 112-113.
- Knüsel, O. v.** Calcification of cornea, new slit lamp finding. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 282-285.
- Lampert.** Localization of pathologic processes in cornea. *Arch. d'Ophth.*, 1924, v. 41, pp. 217-219.
- Lees, D.** Interstitial keratitis. *Edinburgh Med. Jour.*, 1924, v. 31 (Exhibit of Patients) pp. 69-73.
- Lehner, A. v.** Circulation in capillaries at corneal margin of human eyes free from inflammation. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 16-30.
- Lipschütz, B.** Etiology of herpes zoster. *Wien. klin. Woch.*, 1924, Feb. 21, pp. 183-187.
- Mans.** Normal and Pathologic changes of cornea. *Münch. med. Woch.*, 1924, March 21, p. 385.

Rateau, J. Inflammatory form of rheumatismal sclero-tenonitis. *Arch. d'Opht.*, 1924, v. 41, pp. 226-228.

Reis, W. v. Megalocornea. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 237-238.

Report on institutional treatment of interstitial keratitis. *Brit. Jour. Ophth.*, 1924, v. 8, pp. 233-234.

Ricker, G. v. Circulation in capillaries at corneal margin in human eye. *Graefe's Arch. f. Ophth.*, 1924, v. 113, p. 421-426.

Sédan, J. Recurrent blennorrhagic keratitis. *Presse Méd.*, 1924, March 12, p. 232.

Sédan, J. and Herrmann, R. Eberthian panophthalmitis complication of experimental typhic keratitis. *Soc. de Biol. de Marseille. Abst. Presse Méd.*, 1924, April 9, p. 318. *Gaz. des Hôp.*, 1924, v. 97, p. 487.

Stobie, W. Association of blue sclerotics with brittle bones and progressive deafness. (1 chart, bibl.) *Quarterly Jour. Med.*, 1924, April, pp. 274-287.

Thier, C. v. Treatment of rodent corneal ulcer. *Arch. f. Augenh.*, 1924, v. 94, pp. 95-99.

Thompson. Congenital staphyloma. *A. J. O.*, 1924, v. 7, p. 394.

ANTERIOR CHAMBER AND PUPIL.

Alterthum, L. Anisocoria provoked by pulmonary tuberculosis. *Deut. med. Woch.*, 1924, Feb. 29, pp. 275-276.

Barré and Crusem. Syndrome of Bernard-Horner and edema of superior member from retrosternal goiter. *Soc. d'Oto-Neuro-Ocul. de Strasbourg*, 1923, Dec. *Abst. Clin. Opht.*, 1924, v. 28, p. 180.

Brugi, A. Inequality of pupils in early pulmonary tuberculosis. *Pensiero Méd.*, 1924, No. 3. *Abst. Semana Méd.*, 1924, March 13, p. 497.

Duverger. Development of Argyll Robertson sign in tabes. *Presse Méd.* 1924, April 2, p. 296.

Gilbert, W. v. Aqueous humor. *Arch. f. Augenh.*, 1924, v. 94, pp. 101-103.

Meesmann, A. v. Anatomic findings in eyes with deposit of cholesterol crystal in aqueous humor and secondary atheromatous changes in cornea. (bibl.) *Arch. f. Augenh.*, 1924, v. 94, p. 56.

Meyer, A. Westphal pupil phenomenon in encephalitis. *Arch. f. Psychiat. u. Nerven.*, v. 68. *Abst. Wiener klin. Woch.*, 1924, April 17, p. 398.

Murase. Pupillary light reaction. *Pflüger's Arch.*, v. 197, p. 261. *Abst. Arch. f. Augenh.* 1924, v. 94, p. 74.

Weber, P. Argyll Robertson pupil with mydriasis. *Abst. Brit. Jour. of Child. Dis.*, 1924, v. 21, p. 63.

THE UVEAL TRACT.

Hamburger. Paracentesis in chronic iridocyclitis. (dis.) *Wiener ophth. Ges.*, 1924, Jan. *Abst. Wiener klin. Woch.*, Feb. 14, p. 178.

Jacqueau and Bujadoun. Gumma of iris and pigmented dermatitis. *Soc. d'Opht. de Lyon*, 1924, Feb. *Abst. Clin. Opht.*, 1924, v. 28, p. 172.

Lerner, M. L. Uveitis, pathogenesis, clinical subdivisions and classifications. (bibl.) *New York State Jour. Med.*, 1924, v. 24, pp. 597-601.

Marin Amat, M. Aniridia, nystagmus, astigmatic hyperopia and anterior polar cataract in both eyes and convergent squint of right eye of congenital origin. *Arch. de Off. Hisp.-Amer.*, 1924, v. 24, pp. 140-142.

Peter, L. C. Nodular iritis due to bacillus of Hansen. *Arch. of Ophth.*, 1924, v. 53, pp. 258-263.

Rollet and Trossat. Coloboma of iris, crystalline lens and choroid. *Soc. d'Opht. de Lyon*, 1924, Feb. *Abst. Clin. Opht.*, 1924, v. 28, p. 175.

Woods, H. Diagnosis and treatment of choroiditis. (dis.) *Southern Med. Jour.*, 1924, v. 17, pp. 362-365.

GLAUCOMA.

Adler, F. H., Landis, E. M., and Jackson, C. L. Tonic effect of sympathetic on ocular blood vessels. (bibl.) *Arch. of Ophth.*, 1924, v. 53, pp. 239-253.

Blüedung, C. Determination of high blood pressure in central artery and intraocular pressure. (bibl.) *Münch. med. Woch.*, 1924, Feb. 29, pp. 264-266.

Brown, E. V. L. Glaucomatous eye with clouded cornea but deep chamber. *A. J. O.*, 1924, v. 7, pp. 373-375.

Constantin. Pilocarpin, eserine, adrenalin in glaucoma. *Arch. d'Opht.*, 1924, v. 41, pp. 229-231.

Cords, R. Cyclodialysis best operation for simple glaucoma. (1 ill. bibl.) *A. J. O.*, 1924, v. 7, pp. 341-345.

Danis. Aneurism of central retinal artery and in conjunction with fibrous proliferation of papilla in glaucoma. (2 ill.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 33-35.

Dotson, W. S. Glaucoma. *Trans. Tennessee State Med. Assn.*, 1924, April. *Abst. J. A. M. A.*, 1924, v. 82, p. 1389.

Giffo. Ocular hypotension. *Bordeaux thesis.* *Abst. Med. Press*, 1924, March 26, p. 260.

Gifford, H. Peripheral iridotomy (Curran) and subconjunctival limbus puncture in glaucoma. *A. J. O.*, 1924, v. 7, pp. 346-351.

Hamburger, C. Treatment of glaucoma. (1 ill. 7 charts, bibl.) *Med. Klin.*, 1924, March 2, pp. 274-277. *Abst. J. A. M. A.*, 1924, v. 82, p. 1233.

Harston, G. M. Glaucoma with reference to Elliot's trephine and new operation of Law. *China Med. Jour.*, 1924, v. 38, p. 12.

Herbert, H. Late sympathetic ophthalmia after trephining. (dis.) *Royal Soc. Med., Sec. on Ophth.*, 1924, Jan. *A. J. O.*, 1924, v. 7, pp. 376-378.

Hiroishi, H. v. Relation between intraocular tension and blood pressure in veins of episclera and vortex. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 212-221.

Imre, J., Jr. Primary glaucoma. (9 ill. bibl.) *Arch. of Ophth.*, 1924, v. 53, pp. 205-227.

- Jennings, C. W.** Early recognition of glaucoma. *Atlantic Med. Jour.*, 1924, v. 27, p. 510.
- Lagrange, H.** Glaucoma and endocrine disturbance. (1 chart) *Presse Méd.*, 1924, April 5, pp. 300-302.
- Lefort.** Spontaneous rupture of sclerotic, inflammatory secondary glaucoma and staphyloma following blennorrhagic conjunctivitis. *Jour. de Méd. de Bordeaux*, 1924, April 10, p. 281.
- Lobel.** Dupuy-Dutemps modification of Elliot operation. *Ann. d'Ocul.*, 1924, v. 161, p. 215.
Prevention of late infection in Elliot operation. (4 ill.) *Arch. d'Opht.*, 1924, v. 41, pp. 220-225.
- Luedde, W. H.** Factors determining choice of operation in glaucoma. (1 ill.) *A. J. O.*, 1924, v. 7, pp. 353-358.
- Malling, B.** Research on relation between iridocyclitis and glaucoma. *Acta Ophth.*, 1923, v. 1, No. 2.
- Serr, H. v.** Elliot's trephine. (bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 186-211.
- Thiel, R. v.** Clinical study of glaucoma. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 329-346.
Effect of adrenalin on intraocular pressure in glaucoma. *Münch. med. Woch.*, 1924, March 21, p. 384.
Changes in ocular fluid of human eye. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 347-359.
- Seidel, E. v.** Experimental research of source of intraocular lymph stream. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 222-236.
- Verhoeff, F. H.** Cyclectomy, new operation for glaucoma. *Arch. of Ophth.*, 1924, v. 53, pp. 228-238.
Iridotaxis, improved method, and after iridectomy. *A. J. O.*, 1924, v. 7, p. 373.
- Weekers, L.** Modification of intraocular pressure. *Presse Méd.*, 1924, Jan. 9, p. 25.
Abst. J. A. M. A., 1924, v. 82, p. 585.
Experimental study of sclerectomy (dis. bibl.) *Bull. Soc. Belge, d'Opht.*, 1923, v. 48, pp. 64-69.
- Woodruff, H. W.** Chronic simple glaucoma with operation. (dis.) *A. J. O.*, 1924, v. 7, p. 387.
- Dean.** Mercuric cyanid injections for incipient cataract. (dis.) *A. J. O.*, 1924, v. 7, p. 394.
Operation for congenital cataract. *A. J. O.*, 1924, v. 7, p. 394.
- Egger, A.** Zonule of Zinn examined after death by slit lamp. (5 ill. bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 1-15.
- Fromaget, C.** Capsulotomy for electric cataract in infant. *Jour. de Méd. de Bordeaux*, 1924, v. 101, p. 280.
- Goldschmidt, M. v.** Autoxidation of normal and pathologic lens. (bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 160-185.
- Hiroishi, H. v.** Parathyroid cataract growth in rats. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 381-391.
- Hogshead, J. M.** Operative technic in cataract operations. *Tenn. Tennessee State Med. Assn.*, 1924, April. *Abst. J. A. M. A.*, 1924, v. 82, p. 1388.
- Knorr, E. A.** Zonular cataract. *A. J. O.*, 1924, v. 7, p. 395.
- Rollet.** Suppuration in 6294 cataract extractions. *Soc. d'Opht. de Lyon*, 1924, Feb. *Abst. Clin. Opht.*, 1924, v. 28, p. 175.
- Simpson, W. L.** Subluxation of crystalline lens. *A. J. O.*, 1924, v. 7, p. 396.
- Taylor, I.** Medical treatment of cataract. *Lancet*, 1924, v. 206, p. 700.
Transient opacities in lens. *Lancet*, 1924, v. 206, p. 858.
- Van Lint.** Parathyroid glands in genesis of cataract after thyroidectomy. *Bruxelles Méd.*, 1923, March 8. *Clin. Opht.*, 1924, v. 28, p. 149.
- Vaucleeroy.** Bilateral congenital cataract. *Bull. Soc. Belge d'Opht.*, 1923, v. 48, p. 32.

THE VITREOUS HUMOR.

- Danis.** Subhyaloid hemorrhage. (6 ill. dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 35-41.
- Rollet and Rosnoblet.** Persistent canal of Cloquet and hyaloid tract. *Soc. d'Opht. de Lyon*, 1923, Dec. *Clin. Opht.*, 1924, v. 28, p. 177.
- Van Duyse.** Hyaloid canal with terminal branches deviated against chorioretinal, macular focus. (dis.) *Soc. Belge d'Opht.*, 1923, v. 48, pp. 13-16.

THE RETINA.

- Abadie, C.** Vascular spasms accompanied by ocular disturbances. *Presse Méd.*, 1924, April 19, pp. 341-342.
- Bailliant, P.** Retinal circulation in normal and pathologic states. *Gaz. des Hôp.*, 1924, v. 97, p. 488.
- Bretagne, P.** Slit lamp and Purkinje's retinal vessels. *Ann. d'Ocul.*, 1924, v. 161, pp. 192-195.
- Coppez, H. and Danis, M.** Angioid streak of retina. (3 ill. 1 col. pl.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 57-64.
- Dieter, W. v.** Purkinje phenomenon in rods and cones of retina. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 141-156.

CRYSTALLINE LENS.

- Atkinson, D. T.** Cataract and lens displacement resulting from injury. *Amer. Jour. Surgery*, 1924, v. 38, pp. 85-87.
Immature cataract. *Intern. Jour. Med. and Surg.*, 1924, v. 37, pp. 188-190.
- Aubaret.** Dimension of nucleus of cataractous lenses. *Presse Méd.*, 1924, March 12, p. 229.
- Blaauw, E. E.** Newer anatomy of lens and development of cataract. (dis.) *A. J. O.*, 1924, v. 7, pp. 392-394.
- Cabannes and Montoux.** Electric cataract. *Jour. de Méd. de Bordeaux*, 1924, v. 101, April 10, p. 280.

Fialho, A. Etiology and clinical significance of retinal hemorrhages. *Brazil-Med.*, 1924, March 8, pp. 123-127.

Finnoff, W. C. Retinitis pigmentosa or choroidoretinitis. (dis.) *A. J. O.*, 1924, v. 7, p. 385.

Frey, J. J. Bilateral choroidoretinitis. *A. J. O.*, 1924, v. 7, p. 397.

Gallemaerts, V. and Coppez, J. H. Ophthalmoscopic image of albuminuric retinitis without albuminuria. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 25-28.

Gamble, R. Amaurotic family idiocy. (dis.) *A. J. O.*, 1924, v. 7, p. 385.

Highet, H. C. Recurrent detachment of retina. *Brit. Jour. Ophth.*, 1924, v. 8, pp. 226-228.

Knorr, E. A. Retinitis pigmentosa. (dis.) *A. J. O.*, 1924, v. 7, p. 396.

Kraus. Retinal detachment in child birth. *Abst. Münch. med. Woch.*, 1924, March 14, p. 353.

Lauber. Peculiar fundus condition. *Wiener ophth. Ges.*, 1924, Jan. *Wiener klin. Woch.*, 1924, Feb. 14, p. 177.

Pieron, H. Minimum of energy in luminous excitation of retina by brief flashes. *Acad. d. Sc.*, 1924, March. *Gaz. des Hôp.*, 1924, v. 97, p. 405.

Savage, M. Embolism of central retinal artery. *A. J. O.*, 1924, v. 7, p. 395.

Terrier, F. Neuroretinitis and amblyopia by ingestion of veronal. (2 fields.) *Arch. d'Opht.*, 1924, v. 41, pp. 204-206.

Uthoff. Treatment of detached retina. *Med. Germano Hisp.-Amer. No. 5.* *Abst. Deut. med. Woch.*, 1924, March 7, p. 322.

TOXIC AMBLYOPIA.

Levy-Valenzi, Claude and Rochard. Amaurosis from carbon monoxid. *Soc. Méd. des Hôp.*, 1924, March 19. *Abst. Gaz. des Hôp.*, 1924, v. 97, p. 406.

Rathery, F. and Gournay. Amaurosis from carbon monoxid. *Soc. Méd. des Hôp.*, 1924, March. *Abst. Gaz. des Hôp.*, 1924, v. 97, p. 440.

Young, A. G. and Loevenhart, A. S. Arsenical compounds cause of eye lesions. *Jour. of Pharm. and Exper. Therap.*, 1924, v. 23, p. 107.

Repeated title. **Andrade.** *A. J. O.*, 1923, v. 6, p. 1022. *Hahnemannian Monthly*, 1924, v. 59, p. 250.

THE OPTIC NERVE.

Aurand. Optic neuritis of dental origin. *Soc. d'Opht. de Lyon*, 1924, Feb. *Clin. Opht.*, 1924, v. 28, p. 174.

Babonneix, L. Optic atrophy of hereditary syphilis. *Soc. de Péd.*, 1924, April. *Abst. Presse Méd.*, 1924, April 26, p. 375.

Badot. Lesions of optic nerves and acute syphilitic infection of central nervous system. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 92-95.

Bertein and Rouquier. Lesion of optic nerve in lethargic encephalitis. *Soc. d'Opht. de Lyon*, 1924, Feb. *Clin. Opht.*, 1924, v. 28, p. 173.

Canuyt and Terracol. Retrobulbar optic neuritis of sinus origin. *Soc. d'Oto-Neuro-Ocul. de Strasbourg*, 1923, Dec. *Clin. Opht.*, 1924, v. 28, p. 179.

Dean. Anomaly of optic discs. *A. J. O.*, 1924, v. 7, p. 394.

Demaria, E. B. Acute optic neuritis from ethmoid and sphenoidal sinusitis. *Semana Méd.*, 1924, March 27, pp. 539-545. *Arch. de Oft.*, 1924, v. 24, pp. 113-129.

Friedman, E. D. and Globus J. H. Primary optic atrophy localizing sign in frontal lobe tumors. (dis.) *Jour. Nerv. and Ment. Dis.*, 1924, v. 59, pp. 499-503.

Genet. Optic neuritis first sign of Bright's disease. *Soc. d'Opht. de Lyon*, 1923, Dec. *Clin. Opht.*, 1924, v. 28, p. 178.

Guillain, G., Alajouanine, T. and Lagrange, H. Papillary hyperemia a syndrome of intolerance of lumbar puncture. (dis.) *Soc. de Biol.* 1924, April. *Presse Méd.*, 1924, April 16, p. 340.

Hirsch. Retrobulbar neuritis. (dis.) *Wiener ophth. Ges.*, 1924, Jan. *Wiener klin. Woch.*, 1924, Feb. 14, p. 177.

Jocqs. Treatment of retrobulbar neuritis. *Clin. Opht.*, 1924, v. 28, pp. 123-130.

Kajikawa. Permeability of intraocular and conjunctival vessels after extirpation of cervical ganglion. *Biochem. Zeit.* v. 133, 1922. *Abst. Arch. f. Augenh.*, 1924, v. 94, p. 25.

Knorr, E. A. Acute neuroretinitis. *A. J. O.*, 1924, v. 7, p. 396.

Rist, Rochon-Duvigneaud and Coutela. Optic neuritis in carbon monoxid poisoning. *Soc. Méd., des Hôp.*, 1924, March 28. *Abst. Gaz. des Hôp.*, 1924, v. 97, p. 470.

Schacherl, M. v. Salvarsan treatment in tabes and optic atrophy. *Deut. Zeit. f. Nerven.*, 1923, v. 77. *Abst. Wien. med. Woch.*, 1924, March 1, p. 506.

Schieck, F. v. Relation of perivascular lymph spaces of retina and optic nerve to subvaginal space of optic nerve. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 157-159.

VISUAL TRACTS AND CENTERS.

Chaudhuri, S. K. Memory sight. *Brit. Med. Jour.*, 1924, March 29, p. 600.

Ellett, E. C. Paralysis of cervical sympathetic. *A. J. O.*, 1924, v. 7, p. 397.

Elliot, R. H. Memory sight. *Brit. Med. Jour.*, 1924, March 29, p. 600.

Hartmann, E. Physiology and pathology of section of trigeminus in man. 13 charts, (bibl.) *Ann. d'Ocul.*, 1924, v. 161, pp. 161-185.

Kleist. Physiology and pathology of extent of center of vision. *Münch. med. Woch.*, 1924, March 21, p. 384.

Landolt, M. Chiasm and binocular vision. *Arch. d'Opht.*, 1924, v. 41, pp. 193-203.

Lenz. Brain condition in botulism with eye symptoms. *Abst. Klin. Woch.*, 1924, Jan. p. 125.

Payr, E. v. Operation for brain pressure, choked disc and hydrocephalus. *Zent. f. Chir.*, 1924, Jan. pp. 28-35.

Roelofs, C. O. v. Localization with sense of vision. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 239-281.

Strebel, J. v. Hemianopia (30 ills. bibl.) *Arch. f. Augenh.*, 1924, v. 94, pp. 27-55.

Repeated titles. **Delorme.** (A. J. O., 1924, v. 7, p. 420) *Intern. Sur. Ophth.*, 1924, v. 7, p. 118. **Sichel and Fraser.** (A. J. O., 1924, v. 7, p. 77) *A. J. O.*, 1924, v. 7, p. 410.

COLOR VISION.

Blatt, N. v. Disturbance of color vision with anisometropia. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 134-140.

Edridge-Green, F. W. Temporary color blindness. *Lancet*, 1924, v. 206, pp. 801-802.

Wöflflin, E. Heredity of anomalous trichromat. (3 charts) *Pflüger's Arch. f. d. g. Physiol.*, 1923, v. 201, pp. 214-219.

DISEASES OF THE EYEBALL.

Bane, W. C. Exophthalmus. (dis.) *A. J. O.*, 1924, v. 7, p. 383.

Benedict, W. L. Substitute operation for enucleation of eye. *Surg. Gynec. and Obst.*, 1924, v. 38, pp. 697-698.

Cabannes and Montoux. Exophthalmos of left eye from retrobulbar blood effusion during whooping cough. *Jour. de Méd. de Bordeaux*, 1924, March 25, p. 215.

Caudière, M. First stages in development of eye in human embryo. *Soc. de Biol.* 1924, March. *Abst. Gaz. des Hôp.*, 1924, v. 97, p. 487.

Dimmer. Exophthalmos with choked disc. *Wiener ophth. Ges.*, 1924, Jan. *Wiener klin. Woch.*, 1924, Feb. 14, p. 178.

Ellett, E. C. Glass ball implantation. *A. J. O.*, 1924, v. 7, p. 396.

Gerdes. Luxation of globe as birth injury. *Munch. med. Woch.*, 1924, Feb. 29, p. 274.

Hippel, v. Pulsating exophthalmos. *Abst. Klin. Woch.*, 1924, Feb. 5, p. 252.

Kinnear, J. Cyclops. *Edinburgh Med. Jour.*, 1924, v. 31, p. 271.

Lemoine and Valois. Enucleation and oculo-cardiac reflex. *Ann. d'Ocul.*, 1924, v. 161, pp. 185-191.

Miyabara, T. Hyperglycemia and exophthalmos. *Jour. of Exper. Med.*, 1923, v. 7, Nos. 11-12.

Peters. Tuberculosis of anterior segment of eyeball. *Abst. Münch. med. Woch.*, 1924, March 14, p. 352.

Sedan, J. and Hermann, R. Panophthalmitis with corneal complication. *Soc. de Biol.*, 1924, March. *Abst. Gaz. des Hôp.*, 1924, v. 97, p. 487.

Repeated title. **Longuet.** (A. J. O., 1924, v. 7, p. 421) *Intern. Sur. Ophth.*, 1924, v. 7, p. 111.

THE LACRIMAL APPARATUS.

Black, M. Cyst of lacrimal gland. (dis.) *A. J. O.*, 1924, v. 7, p. 384.

Charousek. Paralacrimal mucocoele. *Verein deut. Aerzte*, 1924, Jan. *Abst. Med. Klin.*, 1924, March 9, p. 329.

Gillum, J. R. Dacryocystorhinostomy. *Indiana State Med. Jour.*, 1924, v. 17, p. 113.

DISEASES OF THE LIDS.

Blake, E. M. Allergic reaction of the eye lids. *Arch. of Ophth.*, 1924, v. 53, pp. 272-273.

Brandes. Chronic inflammation of Meibomian glands and autogenous vaccine. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 84-87.

Campos, E. Swelling of lids and hyperemia of conjunctiva. *Brazil Med.*, 1924, March 22, p. 160.

Gallemaerts. Hess operation for ptosis. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, p. 31.

Gerschun, W. Primary luetic lesion of lower lids. *Klin. Woch.*, 1924, March 11, p. 453.

Gifford, S. R. Sporotrichosis of lids. *Arch. of Ophth.*, 1924, v. 53, pp. 264-266.

Lodge, S. and Lodge, W. O. Hysteric bilateral ptosis and convergence excess. (bibl.) *Lancet*, 1924, v. 206, pp. 699-700.

Marbaix. Congenital ptosis cured by Motaïs operation. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 71-75.

Rocher and Brunetière. Cicatrix of brow after burn and double ectropion. *Jour. de Méd. de Bordeaux*, 1924, v. 101, p. 280.

Szillinsky. Pathology of movement of upper lids. *Med. Gesell. in Jena*, 1924, Jan. *Abst. Klin. Woch.*, 1924, April 1, p. 603.

Vaucleroy. Eczema of lids. *Bull. Soc. Belge d'Opht.*, 1923, v. 48, p. 32.

Wirth, M. v. Chronic suppuration of Meibomian glands. (bibl.) *Arch. f. Augenh.*, 1924, v. 94, pp. 73-78.

DISEASES OF THE ORBIT.

Bertein. Orbital osteoperiostitis and sinusitis. *Soc. d'Opht. de Lyon*, 1923, Dec. *Clin. Opht.*, 1924, v. 28, p. 177.

Bremer, F. and Coppez, H. Angioma of cavernous sinus with acromegaly. (3 ills. 1 pl. dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 79-84.

Byers, W. G. M. Encapsulated angioma of orbit. *Arch. of Ophth.*, 1924, v. 53, pp. 280-283.

Campos, E. Inflammation of rim of orbit. *Brazil-Med.*, 1924, March 8, p. 134.

Pandeleco. Inclusion of formalized cartilage in capsule of Tenon after enucleation. *Ann. d'Ocul.*, 1924, v. 161, p. 214.

Sedan, J. and Zucarelli, C. High degree of exophthalmus from spontaneous hematoma of orbit. *Gaz. des Hôp.*, 1924, v. 97, pp. 385-388.

Tiscornia, A. Symmetric lymphoma of both orbits. *Rev. de la Asoc. Med. Argentina*, 1923, v. 36, p. 818. *Abst. J. A. M. A.*, 1924, v. 82, p. 1306.

INJURIES.

Bane, W. C. Chronic irritation after penetrating injury. *A. J. O.*, 1924, v. 7, p. 383.

Bard. Traumatic enophthalmos. *Soc. de Chir. de Lyon*, 1923, March. *Presse Méd.*, 1924, April 5, p. 307.

Beauvieux. Bilateral traumatic rupture of sclera. *Arch. d'Opht.*, 1919. *Abst. Brit. Jour. Ophth.*, 1924, v. 8, p. 240.

- Bussy.** Abscess of superciliary region caused by foreign body in palpebral conjunctiva. *Soc. d'Opht. de Lyon*, 1923, Jan. Clin. Opht., 1924, v. 28, p. 178.
- Carris, L. H. and Resnick, L.** Nature and cause of eye injuries. *Safety Engineer*, 1924, March. *Abst. News Letter*, 1924, April.
- Genet, L.** Bursting of globe by blow of heavy piece of glass. *Clin. Opht.*, 1924, v. 28, p. 172.
- Iritis and hypopyon.** Extraction of magnetic intraocular foreign body. *Clin. Opht.*, 1924, v. 28, p. 173.
- Foreign body in crystalline lens.** *Clin. Opht.*, 1924, v. 28, p. 173.
- Ocular siderosis and unsuspected, magnetic foreign body.** *Clin. Opht.*, 1924, v. 28, p. 172.
- Greig, D. M.** Traversing wounds of orbit. (1 pl. bibl.) *Edinburgh Med. Jour.*, 1924, v. 31, pp. 241-262.
- Halle.** Ocular injury involving nose and orbit. *Abst. Klin. Woch.*, 1924, Jan. p. 204.
- Kerbrat, M.** Foreign body in iris tolerated five years. (1 ill.) *Ann. d'Ocul.*, 1924, v. 161, pp. 196-198.
- Knorr, A. E.** Ruptured choroid. (dis.) *A. J. O.*, 1924, v. 7, p. 395.
- McCaw, J. A.** Magnet extraction (dis.) *A. J. O.*, 1924, v. 7, p. 384.
- Pandeleco.** Movable foreign body in anterior chamber. *Soc. Roumaine d'Opht. de Bucarest*, 1923, March. *Abst. Ann. d'Ocul.*, 1924, v. 161, p. 214.
- Pavia, J. L.** Prognosis of projectiles in orbit. *Rev. de la Asoc. Med. Argentina*, 1923, v. 36, p. 783.
- Rollet and Rosnoblet.** Projection of heated metal into eye. *Soc. d'Opht. de Lyon*, 1924, Feb. *Clin. Opht.*, 1924, v. 28, p. 175.
- Shroff, A. D.** Perforating injury of eye from foreign body. *Indian Med. Gaz.*, 1924, v. 59, p. 142.
- Smith, H. B.** Foreign body in orbit. (2 ills.) *Long Island Med. Jour.*, 1924, v. 18, pp. 147-148.
- Verwey, A.** Localization of foreign body in eye in relation to rotation center. (2 ills.) *A. J. O.*, 1924, v. 7, pp. 337-340.
- Williams, C. B.** Rupture of choroid. (2 ills.) *A. J. O.*, 1924, v. 7, p. 375.
- Repeated title.** *Vogt.* (*A. J. O.*, 1924, v. 7, p. 175.) *Med. Jour. and Record*, 1924, v. 119, p. 429.
- TUMORS.**
- Black, M.** Epithelioma of cornea. (dis.) *A. J. O.*, 1924, v. 7, p. 384.
- Coppez, J. H.** Osteosarcoma of orbit treated by deep radiotherapy. (2 ills. 2 pl.) *Bull. Belge d'Opht.*, 1923, v. 48, pp. 28-31.
- Frôes, H. P.** Epithelioma of palpebro-orbital region. (4 ills.) *Brazil Med.*, 1924, March 22, pp. 155-158.
- Gil and Satanowsky.** Cysts of eyelids. *Rev. de la Asoc. Med. Argentina*, 1923, v. 36, p. 807.
- Gradle, H. S.** Dermoid cyst of lid. *Arch. of Ophth.*, 1924, v. 53, pp. 254-257.
- Hansell, H. F.** Sarcoma of choroid. *A. J. O.*, 1924, v. 7, pp. 359-361.
- Heine, L. v.** Melanosis and sarcosis of iris. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 417-420.
- Hoorens.** Conjunctiva epithelioma involving conjunctival cul-de-sac and lids. *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 41-42.
- Jumentié, J. and Chausseblanche.** Tumor of third ventricle. (3 ills.) *Presse Méd.*, 1924, March 12, p. 225.
- Lapersonne, F. de.** Psammoma of optic nerve. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 46-51.
- Przybylska, J.** Plasmoma of orbit. (2 ills. bibl.) *Ann. d'Ocul.*, 1924, v. 161, pp. 199-207.
- Shields, J. M.** Iris cyst. (dis.) *A. J. O.*, 1924, v. 7, p. 383.
- Van Duyse, D. and Moret.** Pseudoosteoma of orbit and epitheliosteoma of temporal fossa. (1 ill. dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, pp. 52-56.
- Watzold, P. v.** Nevus of bulbar conjunctiva becoming carcinomatous. *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 286-328.
- Wolff, H.** Cholesteatoma of frontal sinus with eye complications. *Brun's Beitr. klin. Chir.*, 1923, v. 130, pp. 215-223.
- PARASITES.**
- Schall.** *Cysticercus subretinalis.* *Abst. Klin. Woch.*, 1924, Feb., pp. 301-302.
- COMPARATIVE OPHTHALMOLOGY.**
- Seto, T. v.** Electromotor strength of frog's retina. (5 ills. bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 115-125.
- Wölfflin, E.** Fundus of lion. *Zeit. f. Anat. u. Entwickl.*, 1923, v. 69, pp. 1-4.
- GENERAL PATHOLOGY.**
- Baron, A. v.** Classification of orbital cyclindroma. (1 ill. bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 31-40.
- Finnoff, W. C.** Changes in eyes of rabbits following injection of dead tubercle bacilli into common carotid artery. (2 pl. 6 ills.) *A. J. O.*, 1924, v. 7, pp. 365-372.
- Kleefeld.** Rose Bengale and pneumococcic corneal ulcers. (dis.) *Bull. Soc. Belge d'Opht.*, 1923, v. 48, p. 18-24.
- Leys, D.** Postmortem changes in fundus oculi. *Brit. Med. Jour.* 1924, March 29, p. 600.
- Rose, G.** Experimental keratoconjunctivitis infection of rabbit. *Zeit. f. Hyg. u. Infektionsk.*, 1924, v. 101, No. 3. *Abst. Münch. med. Woch.*, 1924, March 14, p. 346.
- GENERAL AND EXTRAOCULAR DISEASES.**
- Braunstein, E. P.** Ocular affections with typhus. (bibl.) *Graefe's Arch. f. Ophth.*, 1924, v. 113, pp. 359-380.
- Creutzfeld, H. G.** Acute multiple sclerosis. *Arch. f. Psychiat. u. Nerven.* v. 68. *Abst. Wiener klin. Woch.*, 1924, April 17, p. 398.
- Cushman, B.** Diseases of eye in relation to general systemic lesions. *Amer. Jour. Clin. Med.*, 1924, v. 31, pp. 243-244.

- Danis.** Ocular lesions of erythremia. Bull. Soc. Belge d'Opht., 1923, v. 48, pp. 9-13.
- Eckstein, A. and Szily, A. v.** Lactation and vitamin deficiency. (3 ill.) Klin. Woch., 1924, Jan 1, p. 15.
- Guillery, H.** Toxic tuberculoid structures. Zeit. f. Tuberculose, v. 38, p. 1. Abst. A. J. O., 1924, v. 7, p. 409.
- Igersheimer, J.** Tuberculosis problem and eye. (bibl.) Klin. Woch., 1924, April 15, p. 668-673.
- Kleefeld.** Influence of surgical treatment of Basedow's disease on Graefe's sign. Bull. Soc. Belge d'Opht., 1923, v. 48, pp. 75-79.
- Leri, A.** Oxycephaly in eye disturbances. Presse Méd., 1924, Jan. 19. Abst. Med. Jour. and Record, 1924, v. 119, p. 429.
- McCulloch, R. J. P.** Headaches of ocular or nasal origin. Canadian Pract., 1924, v. 49, p. 204-208.
- Marin Amat, M.** Ocular disturbance as primary manifestation in lethargic encephalitis. Arch. de Oft. Hisp.-Amer., 1924, v. 24, pp. 138-140.
- Mongini, S.** Amaurosis in epidemic encephalitis. La Riforma Med., 1921. Abst. Jour. Nerv. and Ment. Dis., 1924, v. 59, p. 531.
- Mournier.** Surgical treatment of facial neuralgia of fronto-orbito-occipital origin. Le Monde Méd., 1924, April 15, pp. 288-298.
- Pichler, J.** Bladder pressure and eye reflex. Wiener klin. Woch., 1924, April 17, p. 396.
- Post, L.** Amblyopia following epistaxis in thromboplastic purpura. (bibl.) Jour. Missouri State Med. Assn., 1924, v. 21, pp. 152-153.
- Spinnhirny, C. and Reys, L.** Oculo-labyrinthine disturbance in encephalitis. Presse Méd., 1924, April 2, p. 296.
- Stucky, J. A.** Deficiency diseases in ophthalmology and otolaryngology. J. A. M. A., 1924, v. 82, p. 1388.
- Sturz.** Oculo-facial syndrome in tumor of cervical sympathetic. Soc. d'Oto-Neuro-Ocul. de Strasbourg, 1923, Dec. Clin. Opht., 1924, v. 28, p. 178.
- Taylor, J. W.** Ocular headaches. Jour. Florida Med. Assn., 1924, v. 10, pp. 242-243.
- Van Driel, B. M.** Ocular lesions of leprosy. Tijdschr. v. Geneesk. Nederl. 1922, v. 62, pp. 770-814. Abst. A. J. O., 1924, v. 7, p. 407.
- Velter.** Millard-Gubler syndrome in tabes. Presse Méd., 1924, April 2, p. 296.

HYGIENE.

- Christenberry, H. E.** Conservation of vision. Tennessee State Med. Assn., 1924, April. Abst. J. A. M. A., 1924, v. 82, p. 1389.
- Elvy, J. C.** Electric lighting and eyestrain. Lancet, 1924, v. 206, p. 875.
- Francis, L. M.** Preventing eye wastage in industry. Natl. Safety News, Dec., 1923, pp. 27-28. Jour. of Industrial Hygiene, abst. suppl. 1924, v. 5, p. 219.
- Henryson, E. J.** Treat your eyes right. Hygeia, 124, April, p. 238.
- Howard, H. J.** Eradication of trachoma among school children in China. China Med. Jour. Abst. A. J. O., 1924, v. 17, p. 408.
- Ling, W. P.** Conservation of vision in China. Natl. Med. Jour. of China, v. 10, No. 1, p. 20.
- Sheard, C.** Effect of quantity and quality of illumination upon the human eye and vision. Safety Engineer., 1924, Feb. Abst. News Letter, 1924, April.
- Synchronously intermittent light in industry.** Brit. Jour. of Ophth., 1924, v. 8, p. 234.
- Weinheimer, L. H.** Visual acuity in industrial cases. Indust. Doctor, 1923, Dec. p. 203. Abst. Jour. of Indust. Hygiene, 1924, v. 5, Abst. suppl. p. 219.

OPHTHALMIC SOCIOLOGY.

- Ling, W. P.** Causes of blindness among Chinese. Natl. Med. Jour. of China, 1923, v. 9, p. 175.
- Sédan, J.** "Il Notturmo" of D'Annunzio. Presse Méd., 1924, April 5, pp. 581-582.
- Walker, S. Jr.** Detection of malingering in industrial ophthalmology. Nation's Health, 1924, v. 6, pp. 243-244.

EDUCATION, HISTORY AND INSTITUTIONS.

- Ophthalmic hospitals of Egypt.** Lancet, 1924, v. 206, p. 861.
- Ophthalmology in Egypt.** Brit. Med. Jour., 1924, April 12, p. 679.
- Ridley, N. C.** Ophthalmology and general practice. Middlemore Lecture, 1923. Brit. Jour. of Ophth., 1924, v. 8, pp. 235-237.